THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2.

Telegrams: LANCET, RAND, LONDON. Telephone: TEMPLE BAR 7228 and 7229.

No. XII. OF VOL. II., 1933. LONDON, SATURDAY, SEPTEMBER 16, 1933 Pp. 120—Price 1s.
No. 5742. Vol. CCXXV. Founded 1823. PUBLISHED WEEKLY. Registered as a Newspaper. Annual Subscription: Inland £2 2s. Abroad £2 10s.

THE TONSILS AND ADENOIDS
AND THEIR DISEASES: INCLUDING THE PART THEY PLAY IN SYSTEMIC DISEASES.
By IRWIN MOORE, M.B., C.M.
Demy 8vo. 395 pp. 107 Illustrations. Price 21s. net.
"On any question regarding tonsils and adenoids, this exhaustive work by Dr. Irwin Moore must be regarded as the final authority for many a long day to come."—PRACTITIONER.
"Provides an admirable guide, reliable and up to date, on the subject dealt with."—MEDICAL TIMES.
"Should be in the library of the medical student, general practitioner, and the consultant."—MEDICAL WORLD.
Wm. Heinemann (Medical Books), Ltd., 99, Great Russell-street, London, W.C.1.

SELECTED WRITINGS OF
JOHN HUGHLINGS JACKSON,
M.D., F.R.C.P., F.R.S.
Two Volumes.
I.—EPILEPSY AND EPILEPTIFORM CONVULSIONS.
II.—EVOLUTION AND DISSOLUTION OF THE NERVOUS SYSTEM: SPEECH: VARIOUS PAPERS: ADDRESSES AND LECTURES.
Edited by JAMES TAYLOR, M.D., F.R.C.P.
With the advice and assistance of GORDON HOLMES, M.D., F.R.C.P., and F. M. R. WALSHE, M.D., F.R.C.P.
Over 500 pages in each vol. Price 25s. net each; postage extra (inland 9d., abroad 10d.).
Hodder & Stoughton Ltd., Warwick-square, E.C.4.

PUBLICATIONS OF THE
MIDDLESEX HOSPITAL PRESS.
SOME RADIUM CASES AT THE MIDDLESEX HOSPITAL.
A Photographic Record. By A. CAMERON MACLEOD, M.B., B.S., F.R.C.S. Illustrated. 7s. 6d. net.
GASTRIC ACIDITY. By J. D. ROBERTSON, M.D. An Historical and Experimental Study. With Diagrams. 5s. net.
London: John Murray.

GYNÆCOLOGY FOR NURSES AND GYNÆCOLOGICAL NURSING. By COMYNS BERKELEY, M.D., M.C., F.R.C.P., F.R.C.S., etc. (Consulting Obstetric and Gynæcological Surgeon to the Middlesex Hospital). 6th Edition in preparation. 7s. 6d. net.
Faber & Faber, Russell-square, London.

¶ "*This book should certainly make and keep for itself a place in urological literature.*"—LANCET.

UROLOGY IN WOMEN:
A HANDBOOK OF URINARY DISEASES IN THE FEMALE SEX.
By E. CATHERINE LEWIS, M.S. (Lond.), F.R.C.S. (Eng.), Surgeon to the Royal Free Hospital, Surgeon and Urologist to the South London Hospital for Women.
Size 6½×8½. Pp. viii.+73. With 4 Coloured Plates and 23 other Illustrations. Price 6s.; postage 5d.; abroad 9d.
Baillière, Tindall & Cox, 7 & 8, Henrietta-street, London, W.C.2.

OESOPHAGEAL OBSTRUCTION:
ITS PATHOLOGY, DIAGNOSIS AND TREATMENT
(including four chapters on Cancer of the Œsophagus).
By A. LAWRENCE ABEL, M.S. Lond., F.R.C.S. Eng., Assistant Surgeon to the Cancer Hospital, &c.
Pp. 245. 132 Illustrations. 2 Col. Plates. 30s. net.
"Masterful and complete . . . Cannot be too highly praised."—SURG. GYN. AND OBSTET. JOUR.
Oxford University Press, Amen House, London, E.C.4.

THE PRACTICAL TREATMENT OF
DIABETES.
By T. IZOD BENNETT, M.D. (Lond.), F.R.C.P. (Lond.), Physician with charge of Out-Patients, Middlesex Hospital; Physician to the Royal National Orthopædic Hospital, etc.
The Practitioner.—"This is a clear and readable account of the modern treatment of *diabetes mellitus*."
Constable: 10–12 Orange-street, London, W.C.2. 6s. net.

ANATOMY IN THE LIVING MODEL.
By DAVID WATERSTON, M.A., M.D., F.R.C.S.E., F.R.S.E.,
Bute Professor of Anatomy in the University of St. Andrews.
Pp. 276. 74 Illustrations, 16 coloured plates. Price 25s. net.
". . . It is very readable, and we can recommend it with confidence to students and also to practitioners."—CANADIAN MED. ASSOC. JOUR.
Hodder & Stoughton, Ltd., 20, Warwick-square, E.C.4.

DISEASES OF THE THYROID GLAND.
WITH SPECIAL REFERENCE TO THYROTOXICOSIS.
By CECIL A. JOLL, M.S., B.Sc., F.R.C.S. (Eng.).
Crown 4to. Fully Illustrated. £3 3s. net.
"Mr. Joll has presented his fellow practitioners and students with a monumental volume. They need not trouble to search the literature published up to the time this volume went to press, for they will find everything relevant within its covers."—BRITISH JOURNAL OF SURGERY.
William Heinemann (Medical Books) Ltd., 99, Great Russell-street, London, W.C.1.

FRACTURES.
By MEURICE SINCLAIR, C.M.G., M.B., CH.B. (EDIN.).
With an Introduction by Sir ROBERT JONES, Bt., F.R.C.S.
Pp. 550. 337 X-Ray photographs, photographs and diagrams. 24s. net.
Constable & Co., Ltd., London.

DIAGNOSIS OF MENTAL DEFICIENCY.
By HENRY HERD, M.A., M.B., Ch.B.
Pp. 284. Demy 8vo.
Fully illustrated with 39 half-tone and 12 line blocks.
Price 12s. 6d. net.
"A concise and practical guide to the recognition of mental deficiency on modern lines."—PUBLIC HEALTH.
Hodder & Stoughton, Ltd., Warwick-square, E.C.4.

DISEASES OF THE HEART
THEIR DIAGNOSIS, PROGNOSIS, AND TREATMENT BY MODERN METHODS
With chapters on the Ink Polygraph, Clinical Electro-Cardiography, and Anæsthesia in relation to Cardio-Vascular Affections.
By FREDERICK W. PRICE, M.D., F.R.S. (Edin.),
Senior Physician to the National Hospital for Diseases of the Heart; Consulting Physician to the Royal Northern Hospital, London.
Demy 8vo. Pp. 534. With 249 text figures, including 32 sphygmograms, 92 polygraphic tracings, and 87 electro-cardiograms.
NEW SECOND EDITION. 21s. net.
"By great care and by the use of an amazing amount of material, he has accomplished what many readers have been waiting for, giving us a complete account of the diagnosis, prognosis, and treatment of heart diseases by modern methods in association with all the invaluable teaching bequeathed to us by the older masters of clinical observations."—LANCET.
"The most valuable and comprehensive guide to the study of Cardiology with which we are acquainted."—NEW YORK MEDICAL JOURNAL AND RECORD.
"We think that most of our readers engaged in general practice will find this work extremely useful."—THE JOURNAL OF CLINICAL RESEARCH.
"In our opinion the book is indisputably the most authoritative contribution to Cardiology of our time."—FRANCO-BRITISH MEDICAL REVIEW.
"A book which we believe is destined to remain the standard work on Cardiology for many years to come."—AMERICAN MEDICINE.
"The second edition of this popular work on heart disease bears evidence of thorough revision, while the essentially clinical standpoint of the writer is maintained."—EDIN. MED. JOUR.
"It may be said at once that the book adequately fulfils the purpose it has in view and is a perfectly sound, lucid, and reliable guide."—NEWCASTLE MEDICAL JOURNAL.
"Well written, concise, and complete, containing a wealth of practical information. Obviously based upon the author's own experience and investigative work."—SURGERY, GYNECOLOGY, AND OBSTETRICS (Official Journal of the American College of Surgeons).
"Dr. Price is to be congratulated again on the reappearance in its second edition of his distinguished contribution to the increasingly important subject of Cardiology."—THE CANADIAN JOURNAL OF MEDICINE AND SURGERY.
OXFORD UNIVERSITY PRESS, Amen House, Warwick Square, London, E.C.4.

Elixir Bromo-Valerianate (Gabail)

exerts a profound influence on the exhausting sweatings and flushings, the nervous irritation and depression, mental excitability, restlessness, and "anxiety neuroses" associated with the MENOPAUSE.

Dose: One tablespoonful twice or thrice daily.

Samples on request

THE ANGLO-FRENCH DRUG CO. LTD., 11 & 12, Guilford Street, LONDON, W.C.1

Felsol *for*

SPASM OF PLAIN MUSCLE

ASTHMA
ANGINA PECTORIS
DYSPNŒA OF PHTHISIS

Felsol relieves QUICKLY and CERTAINLY.
Felsol is ALWAYS READY FOR USE.
Felsol contains NO NARCOTICS.
Felsol consists of Powders for oral administration.

Literature and supply for clinical test from

Telephone Museum 2855

BRITISH FELSOL COMPANY LTD.,
15, Caroline Street, London, W.C. 1

Telegrams Felso', Westcent, London

"The Standard"

A really good strapping suitable for every purpose. Possesses a good grip.
While competitive in price, Zopla is sold on quality alone; this is acknowledged to be good.
Dependable always. Each spool in metal container.

Write for sample and price list.

ZOPLA-BAND (Elastic Plaster Bandage)
for varicose veins, ulcers, sprains, etc.

LESLIES, LTD., High St., Walthamstow, London, E.17
MANUFACTURERS OF PLASTERS SINCE 1825

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, CHEMISTRY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

No. 5742 LONDON, SATURDAY, SEPTEMBER 16, 1933 CCXXV

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ADDRESSES AND ORIGINAL ARTICLES

Some Considerations in the Treatment of Acute Suppuration. By F. D. SANER, F.R.C.S. 627

Relationship Between the Anti-anæmic Principles in Stomach and Liver. By J. F. WILKINSON, M.R.C.P., F.I.C., and LOUIS KLEIN, Ph.D., F.I.C.—(*Illustrated*) 629

Parenteral Acriflavine in the Treatment of Gonorrhœa. By E. HUGHES, M.B., D.P.H., and C. ALLAN BIRCH, M.R.C.P., D.P.H. 633

The Value of the Meningococcal Complement-Fixation Test. By H. A. COOKSON, M.B., D.P.H., and J. ELLIOTT SINCLAIR 634

Tuberculous Meningitis in Adults. By A. HILLYARD HOLMES, M.R.C.P. 635

Cancer of the Larynx: The Anchorage of Radium in its Treatment. By N. ASHERSON, F.R.C.S. —(*Illustrated*) 640

Gordon's Test in Hodgkin's Disease. By R. F. OGILVIE, M.R.C.P., and C. E. VAN ROOYEN, M.B. 641

Treatment of Cancer with Connective Tissue Extracts. By H. SEARLE BAKER, M.R.C.S. 643

An Anaerobic Gram-negative Bacillus as a Cause of Pyæmia. By A. W. FRANKLIN, M.R.C.P.—(*Illustrated*) . 645

Specific Treatment for Trichomonad Vaginitis. By J. R. GOODALL, M.D. 648

BRITISH MEDICAL ASSOCIATION

ANNUAL MEETING IN DUBLIN

Section of Pathology and Bacteriology: Renal Functional Disturbance. 649

Section of Pharmacology and Therapeutics: Diuretics and their Uses 651

REVIEWS AND NOTICES OF BOOKS

Atlas of Otology. Vol. II. By Albert A. Gray, M.D. 654

Treatment of Rheumatoid Arthritis and Sciatica. By A. H. Douthwaite, F.R.C.P. 654

Leçons sur l'alimentation. By Prof. Giovanni Lorenzini 654

Pediatrics. Edited by Prof. Isaac A. Abt, M.D., and Arthur F. Abt, M.D..... 654

Surgical Pathology. By Prof. William Boyd, F.R.C.P. 655

L'hérédo-syphilis. Clinique et Thérapeutique. By Dr. Jean Hutinel and Dr. Alice Linossier-Ardoin 655

Colds and Hay Fever. By Frank Coke, F.R.C.S... 655

Cytological Technique. By John R. Baker, M.A. ... 655

L'exploration fonctionnelle de la rate. By Ed. Benhamon 656

Acute and Chronic Otitis Media: A Roentgenological Study. By Gösta Runström 656

British Journal of Children's Diseases 656

LEADING ARTICLES

EXCEPTIONALLY GOOD HEALTH 657

SALT ECONOMY AND SWEATING..... 657

THE PERSONAL FACTOR IN TUBERCULOSIS 658

MISSING FACTORS IN ANÆMIA 659

ANNOTATIONS

Should Fire Inquests be Revived? 660

Sodium Nitrite in High Blood Pressure 660

Real and Imaginary Constipation 661

Control of Traffic in Narcotic Drugs..... 661

Are Children's Heart Hospitals Justified?.... 661

Vestibular Nystagmus 662

Atebrin for Malaria in Malaya 662

Bismuth Subnitrate and Methæmoglobinæmia ... 663

A Remedy for Chronic Amœbiasis 663

SPECIAL ARTICLES

British Association: Annual Meeting at Leicester.

The Activity of Nerve-cells.—Practical Value of Physiology to Industry.—Status of Psychology as an Empirical Science 664

Problems of Medical Practice in America. II. ... 667

Medicine and the Law: Unqualified Opticians.—Unauthorised Hospital Collections 669

Budapest: The Health of Boy Scouts..... 669

Scotland: A Hospital Waiting-list 670

United States of America: An Epidemic of Encephalitis 670

PUBLIC HEALTH SERVICES

The Social Worker in the Mental Hospital.—Port Sanitation.—The Decline in Gonorrhœa.—The Format of Reports.—Tuberculosis Reports . 671

Infectious Disease in England and Wales.... 673

CORRESPONDENCE

Eugenics in Germany (Dr. C. P. Blacker) 674

Dental Surgeons in the Medical Directory (Dr. John Fawcett) 674

Unemployed Men in Camp (Dr. J. N. Glaister) 674

PANEL AND CONTRACT PRACTICE

Dropping Out of Benefit.—"Commercially Minded" or Shackled by Regulations 675

THE SERVICES

Royal Naval Medical Service.—Army Medical Services.—Royal Army Medical Corps.—Royal Air Force.—Indian Medical Service.—Royal Army Medical College —Colonial Services 673

OBITUARY

John Playfair, M.D.—(*With portrait*) 676

MEDICAL NEWS

Royal Faculty of Physicians and Surgeons of Glasgow 676

International Cancer Congress 653

Autumn Congresses and Courses in Paris..... 653

Central London Throat, Nose, and Ear Hospital. 663

International Congress of Hydrology 663

University of Bristol 673

Fire at a Tuberculosis Colony..... 673

St. Bartholomew's Hospital 676

St. Mary's Hospital 676

London Hospital 676

St. George's Hospital 676

Middlesex Hospital Medical School..... 676

William Mackenzie Medal . 676

London School of Hygiene and Tropical Medicine.. 676

Eugenics Society..... 677

Salaries at Bradford..... 677

London Hospital Memorial to Lord Knutsford..... 677

NOTES, COMMENTS, AND ABSTRACTS

The Philosophy of Treatment. By E. H. R. ALTOUNYAN, M.D..... 678

Catalogue of Instructional Films..... 680

New Preparations: Angiolysin.—Ergocholin.—Allergilac 680

Operation for Carcinoma of the Cardia 680

Medical Education in Burma..... 681

Biology in Schools 681

Technique in Actinotherapy..... 681

Surgical Tuberculosis in the Senegalese..... 681

Vitamins..... 682

Giants and Dwarfs..... 682

Number of Practising Doctors in Germany.... 682

Foreign Bodies in the Cornea..... 682

Courses in Stagecraft 682

Register of the C.S.M.M.G. 682

Medical Diary 677

Appointments 677

Vacancies 677

Births, Marriages, Deaths 677

THE LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY LIMITED

(FOUNDED 1892)

President: Sir JOHN ROSE BRADFORD, Bart., K.C.M.G., C.B., C.B.E., M.D., F.R.C.P., F.R.S.

Trustees for the Reserve Fund:

Rt. Hon. LORD DAWSON, P.C., G.C.V.O., K.C.B., M.D., P.R.C.P. Sir JOHN ROSE BRADFORD, Bart., K.C.M.G., C.B., C.B.E., M.D., F.R.C.P., F.R.S. Sir SQUIRE SPRIGGE, M.D., F.R.C.P., F.R.C.S.

The Society was founded for the following purposes: To protect, support, and safeguard the character and interests of legally qualified Medical and Dental Practitioners; to advise and assist Members of the Society in matters affecting their professional character and interests; and to indemnify them in regard to actions, etc., undertaken on their behalf.

The Society is fully insured to an unlimited extent against all adverse costs and damages which may be awarded against Members in any action which the Society undertakes on their behalf.

Annual Subscription: £1. Entrance Fee: 10s. Assets exceed £52,000.

No entrance fee to those joining within 12 months of registration.

Application form, and full particulars, from the Secretary, Victory House, Leicester Square, W.C.2.

Telephone: GERRARD 4814.

MOTIVES AND MECHANISMS OF THE MIND

AN INTRODUCTION TO PSYCHOPATHOLOGY AND APPLIED PSYCHOLOGY

BY

E. GRAHAM HOWE, M.B., B.S.

A Series of Twelve Post-Graduate Lectures

DELIVERED UNDER THE AUSPICES OF THE TAVISTOCK SQUARE CLINIC

"To the general practitioner books on psychological subjects are apt to prove somewhat dry and uninteresting. This one is quite an exception. If the reader only peruses the numerous case-histories he will find much to interest him, but he can be assured that the text itself is such that he will not leave off until he has read it in its entirety. Accordingly we have great pleasure in recommending the purchase of this delightfully written volume."

The Medical World.

Demy 8vo. *Cloth.* *pp. 260 + xiv.* *Price 10/6 net*

Post Free Price: Inland and Abroad 11s. 0d.

THE LANCET LTD., 7 Adam Street, Adelphi, W.C.2

THE CLINICAL INTERPRETATION OF AIDS TO DIAGNOSIS

Vols. 1 & 2

Companion Volumes to the "Modern Technique in Treatment" Series

Each volume of The Clinical Interpretation of Aids to Diagnosis contains a series of articles contributed by specialists and workers who have themselves helped to establish the significance of certain tests. The articles are intended to provide information as to when a test is necessary and also to serve as a source of quick reference on the receipt of a report. Preliminary paragraphs are added to each article to enable a rapid survey of its scope to be made.

Demy octavo, of approximately 350 pp., fully illustrated by half-tone plates and text figures, and indexed under titles of articles, authors and diseases.

Price 10s. 6d. net each volume, postage extra. **Inland 1 vol. 6d., 2 vols. 9d. Abroad, each vol. 9d.**

Published by THE LANCET LTD., 7, Adam Street, Adelphi, W.C.2

ADDRESSES AND ORIGINAL ARTICLES

SOME CONSIDERATIONS IN THE TREATMENT OF ACUTE SUPPURATION *

BY F. D. SANER, F.R.C.S. ENG.
SURGEON TO THE ROYAL NORTHERN HOSPITAL, LONDON

OF recent years there has developed a different outlook on the treatment of acute inflammatory and suppurative conditions. Its outstanding feature is that the principle of rest in its widest sense has again been accepted as the essential basis of treatment. Since Hilton so ardently advocated rest more than sixty years ago, this principle has been, so to speak, submerged, because inflammation came to be regarded rather as a state of disease to be attacked than as a manifestation of a mechanism of defence of the body to be assisted by every means at our disposal in accomplishing its main objects—either resolution or suppuration.

During the immediate pre-war period reliance was placed mainly on multiple incisions, tubes, antiseptic irrigations and immersions, and frequent dressings. Several workers, notably Sir Almroth Wright, were pointing out at this time the futility of antiseptics for grossly infected wounds and emphasising the importance of the irrigation of a septic wound by its own tissue fluids, but only during the latter half of the war period was it more generally recognised that methods of treatment which permitted of greater freedom for natural repair to proceed, exaggerated or adapted to meet particular conditions, were the most likely to prove beneficial. The introduction of the salt pack, the Carrel-Dakin method of irrigation, and the application of B.I.P.P. to wounds, were indications of changing ideas, and though at the time any success of these methods was attributed mainly to the action of the particular chemicals employed, it was realised there was merit too in the diminution of interference with the wound itself and the consequently diminished pain and general disturbance. At the same time it was being demonstrated, especially by Meurice Sinclair, in cases of open infected fractures that if the limb was efficiently immobilised after drainage had been provided the wound could to a great extent be left to look after itself.

Some two or three years later Winnett Orr, dealing mainly with cases of acute osteomyelitis and infected open (civil) fractures, advocated enclosure of the limb in a plaster-of-Paris cast, leaving the wound untouched for several weeks. Such treatment was spoken of at the time as revolutionary, but it was in fact a reversion—with differences—to more primitive ideas and a logical sequence to the lessons of the war period brought about by one who had the vision to recognise and the courage to apply them.

In order to gain its full value, rest (and "warmth" must always be added) should be employed when the earliest signs of inflammation become manifest or, better, when an injury, however slight, but a potential site of infection, is received. In this connexion, if the pricked or cut finger, after promoting free bleeding, thorough cleansing, and protection, were immobilised by resting the arm in a sling for 48 hours, there is little doubt that the number of cases of septic fingers and hands, which crowd the departments of every hospital, would be diminished in numbers and in severity. In these minor injuries too much faith is placed in an application of iodine or other antiseptic, which in itself is inadequate.

Incisions

In order to liberate pus from a superficial abscess or one pointing subcutaneously, an incision should be made to expose the whole length of the abscess cavity. In many situations an ellipse of skin and subcutaneous tissue may be removed, thus avoiding the necessity of using tubes or gauze pack to maintain the opening. The wound thus made is covered by some non-adherent dressing—e.g., vaseline gauze—and, except for an occasional change of dressing, further interference is as a rule unnecessary. A similar procedure is employed in cases of suppuration in bone, with the addition, in acute osteomyelitis, that the length of diaphysis involved must be freely opened. Certain criticisms—mainly of "dirtiness"—have been brought against this method and are no doubt justified if the wound is left entirely untouched for weeks on end. Arrangement can be made for an occasional change of the top dressing (or of the plaster itself) or, if the wound has been packed, for renewing the packing with very little disturbance. Any unpleasantness can be avoided without in any way detracting from the merits this method has in fulfilling the essentials of relief of tension, immobilisation, warmth, and a minimum of interference with the wound itself.

After some years of experience of this treatment, in my opinion it can now be fairly claimed that in the general run of cases the depreciation of health formerly associated with bone suppuration is not nearly so marked, with the consequence that repair is hastened and convalescence shortened. It must be admitted that acute osteomyelitis has changed in character and the majority of cases are less severe than formerly. It may be added, however, that all cases should be under close supervision and no attempt made to use this method as a means of treating infected bone cases in an active stage in an out-patient department.

As a general rule, incisions should not be made in inflamed tissue until pus has definitely formed. Certain exceptions may be made to this, however, when an acute inflammatory process is spreading under cover of dense tissue, such as bone or palmar fascia, when the object of an incision is to provide a track, a line of least resistance to the surface for the products of inflammation, rather than to interfere with the area which is itself involved. A more difficult problem arises as to the immediate action indicated when an acute inflammation is spreading without pus formation. In some cases pus formation is delayed only, and sets in eventually; in others, fortunately the minority, it does not occur, while the inflammation becomes widespread leading almost inevitably to a fatal issue. Such conditions, while serious in any situation, are more immediately alarming when the face, scalp, or deep tissue of the neck are concerned, with the fear of spread to the inside of the skull or of respiratory difficulties. On no account should an area of inflammation on the face, in the nose, or on the lip, however small, be incised in a pre-suppurative stage; what appears perhaps to be but a painful pimple, an insect bite, or the early stage of a small carbuncle must be treated with the greatest respect in this situation as they are potential sources of the greatest danger, especially if pricked or cut before pus has formed. On occasion

* Abridged from a post-graduate lecture delivered at the Royal Northern Hospital.

there appears to be no attempt at localisation and pus formation but instead a rapid spread of inflammation over the whole side of the face and perhaps the scalp and neck. It has been advocated that the angular vein should be ligatured on the affected side as a means of blocking one direct communication with the intracranial circulation. While my experience of this is limited to very few cases without benefit, it should be considered at an early stage as possibly helpful.

In cases of deep cellulitis of the neck respiratory difficulties may demand laryngotomy or tracheotomy; apart from this, however, incisions should not be made except to liberate or definitely explore for pus. As a rule, in this type of case deep pus is formed quickly and œdema of the respiratory tract is apt to be coincident with pus formation in the surrounding area. It may be possible therefore to avoid a laryngotomy, but in every case preparation should be made for it, since at any moment the dyspnœa may become urgent.

Appendicitis

The present knowledge of the means adopted by the tissues to arrest and counteract an infection is inadequate. There are unknown factors which it is not possible to alter, and though general measures (hygienic, dietetic, chemical, and ray therapy) are of considerable value, the responsibility still rests too much on the individual to save himself. In a few situations only is the opportunity given of entirely removing the site of an acute inflammatory process, to the great advantage of the individual. This opportunity occurs notably in acute appendicitis.

It is almost axiomatic now that if an appendix becomes the site of acute inflammation its removal, immediate or remote, is inevitable for the future safety of the individual. In recent discussions on this subject the main issue on the whole has been not so much the advisability of removal in all cases, though this is questioned by some, but when the operation can be performed with the greatest safety. As part, perhaps, of the general trend of policy in acute inflammatory conditions there has lately been a revival of what is known as the Ochsner-Sherren method of treatment of appendicitis during the acute stage and until it has passed or an abscess has formed. At the time when this treatment was originally advocated, the majority of cases at any rate were not seen, or not diagnosed, until an immediate pre-abscess or localised abscess stage had been reached, unless a perforation in the earlier stages of the attack had forced the recognition of a varying degree of suppurative peritonitis. The removal of an appendix in the first 12, 24, or 36 hours from the onset of symptoms must have been rare. It is therefore scarcely appropriate to apply any method of treatment now for the same reasons which may have been valid over twenty or more years ago; it is right, however, to discuss it in the light of present knowledge and as an alternative to be adopted should those immediately responsible deem it the safest course in a particular case.

When an acute inflammatory condition arises in any situation it is realised in most instances that suppuration will follow and on the whole the sooner it does so the better. If the appendix is involved, any delay in removal should be advocated with the knowledge that the inflammation is going to resolve—contrary to the usual termination—or if pus forms it is going to be discharged into the bowel, or that the appendix itself will become "shut off" in such a manner as to prevent spread of the inflammation or of pus. The fact that such things do happen does not palliate the dangers in the early stages; the uncertainty of future progress is then so great and the dangers of any particular case so difficult to assess that in the ordinary case, unless obviously mild or quietening, the immediate removal of the appendix must be regarded as the safest policy. The tissues are thus placed straightway in a position to repair and not left to resolve or localise an inflammatory process, a strain to which they may or may not be equal.

If an abscess has already formed and has been localised, it should be drained only and no attempt made at the time to remove the appendix for fear of damage to the abscess wall which, so to speak, is only just holding. During the period of drainage of the abscess the fate of the appendix cannot unfortunately be ascertained; it may be completely destroyed, or on the other hand a remnant or practically the whole appendix may be left in situ. On account of this uncertainty the appendix should be removed at a later date, and though on occasion such advice may prove to have been unnecessary, the experience of further serious trouble from appendices which have been left has been convincing.

There is the intermediate stage in the course of acute appendicitis when, so far as can be judged, the appendix itself has been "shut off" without pus formation outside the appendix. This stage does not correspond with any particular period of time in the attack. An inflamed appendix may be wrapped round with omentum within a few hours or by its position be covered with bowel; on the other hand at the third or fourth day (more especially in children) it may be found lying free in the general peritoneal cavity; localisation can only be roughly estimated by the degree of intensity of the local and general signs and symptoms. While each case should be judged individually and treatment not made to fit in with any particular theory which may be under discussion at the time, it is in this type of appendix case that, in my opinion, the actual method used for removal of the appendix assumes the very greatest importance.

The Gridiron Incision and Drainage

The body reacts to an acute inflammatory process in the abdominal (or thoracic) cavity in no different manner from that in which it reacts to one in any other situation. The first endeavour is to immobilise the structures immediately surrounding the process, and in the abdomen the movements of the abdominal wall and the intestines are at once slowed down and eventually brought to a standstill, while the peritoneum and omentum are used to try to keep the inflammation within limits and avoid spread to the general peritoneal cavity. These protective measures are initiated in the earliest stages and vary considerably in their success in different individuals, depending, to some extent at any rate, on the position of the appendix. The first consideration must be to avoid, as far as is possible, any disturbance of this protective mechanism. In no other situation in the body would there be any question of making an incision into an abscess, or potential abscess, otherwise than directly over the centre of it; in the wildest moment no one would advocate the opening of say an inguinal abscess from the buttock! Why, then, should it be taught that a median or paramedian abdominal incision is justifiable for the removal of an inflamed appendix which, except perhaps in its very early stages, is surrounded by structures endeavouring to keep the infection within bounds? Apart from the danger of spreading infection, the

unavoidable handling of already "tired" gut, which such an incision entails, results almost inevitably in a varying degree of intestinal paresis. This disturbance is avoidable by the employment of the gridiron incision, when the small intestine is scarcely seen and certainly not handled; or, if a palpable mass is present, by an incision directly over the centre of the mass. The arguments usually put forward against the use of the gridiron incision are that difficulties may arise should the diagnosis prove to be wrong, or from lack of space if the appendix is not found immediately under the line of incision. Such difficulties can be easily overcome and, in my opinion, do not diminish in any way the great advantages gained by removing the appendix with a minimum of disturbance to the abdominal cavity in general and the small intestine in particular.

Again, the abdominal wall should not be completely closed after the removal of an appendix when it is uncertain if tension has been completely relieved, for example, in the presence of fluid which may be contaminated or when there is any marked degree of œdema of the gut wall, mesentery, or retroperitoneal tissues. In these cases there is still the possibility of continuation of the inflammation and spread of infection.

The use of the gridiron incision as the approach to the appendix and a ready willingness to drain the abdominal cavity rather than a keen desire to close it even with a risk, makes in my experience the removal of an inflamed appendix a very safe procedure, with a minimum of local or general disturbance at any period of its course, with the exception, as mentioned, during an abscess stage. The drainage of the cavity cannot yet be said to be satisfactory, inasmuch as it is impossible to expose completely an area of suppuration in the same manner as is possible in many other situations. Additional stab incisions are the means only, as a rule, of infecting fresh areas of the abdomen without a corresponding gain in the efficiency of the drainage. We depend still on the rubber tube which, on the whole, serves its purpose faithfully rather than with a high degree of efficiency. Its purpose should not be considered to aid discharge of pus through its bore (per se a rubber tube has no particular merit except its consistence), but as a suitable means only of creating and maintaining a line of least resistance to the surface as large as is possible, and as such its purpose is lost if the tube is removed before a track is definitely established.

THE RELATIONSHIP BETWEEN THE ANTI-ANÆMIC PRINCIPLES IN STOMACH AND LIVER

By John F. Wilkinson, M.D., M.Sc., Ph.D. Manch., M.R.C.P. Lond., F.I.C.

Director of the Department of Clinical Investigations and Research, and Lecturer in Systematic Medicine, University and Royal Infirmary, Manchester; and

Louis Klein, M.Sc., Ph.D.Lond., F.I.C.

Biochemist in the Department

Since the recognition of the value of liver and of hog's stomach in the treatment of pernicious anæmia much attention has been devoted to the nature of the active anti-anæmic principles in these two organs and their mutual relationship.

The work of Cohn, Minot, and their co-workers [1] suggests that the liver active principle may be an ω-amino or imino-acid, but its constitution remains undecided. In previous communications [2 3] we showed that the active principle in hog's stomach, for which we proposed the term "hæmopoietin," was more unstable than, and had different properties from, the active principle in liver. We tentatively suggested that hæmopoietin was of an enzyme-like nature and that by its action on the proteins or some other substance present in a normal diet it could produce the liver active principle, or a similar substance, which might be stored in the liver until required for the formation of red blood-cells. In the present paper we report further experiments which appear to confirm these views as to the enzyme nature of hæmopoietin and its relationship to the liver principle. We have also been able to demonstrate the formation, outside the body, of the liver active principle or a similar substance, without the use of liver, by the action of hæmopoietin on beef—a change which hitherto has been believed to take place only in vivo.

The cases of pernicious anæmia used in the following experiments for the purpose of testing the hæmopoietic activity of unknown material were all carefully chosen according to the rigid criteria already laid down by one of us,[4] and although for brevity we have omitted in the text the preliminary control periods, these were carried out in every case. All the clinical tests were made at least in duplicate, usually in triplicate.

Experiments with Fractions obtained from Hog's Stomach

I.—EFFECT OF FRACTION P5 AND FRACTION P5 (MUCOSA)

In previous communications [2 3] we described a hæmopoietically active fraction "P5" obtained by precipitating with alcohol the press juice from hog's stomach. We found that this fraction in initial doses of 5 g. daily gave very satisfactory responses in cases of pernicious anæmia; thus, in another case tested recently, we obtained a reticulocyte peak of 42·1 per cent. on the thirteenth day whilst the red blood-cells (R.B.C.) and hæmoglobin (Hb.) showed rapid increases.

Case 280.

Day of treatment.

1st	R.B.C. 1,230,000	....	Hb. 28 per cent.
34th	R.B.C. 3,000,000	....	Hb. 82 ,,

When the press juice obtained from the mucosa of hog's stomach was precipitated with alcohol a fraction "P5 (mucosa)" was obtained; this was similar in its properties to the ordinary fraction P5, though it appeared to be somewhat more active peptically and hæmopoietically. The usual yield of fraction P5 (mucosa) was 18–22 g. per 500 c.cm. of press juice (from mucosa), 1 g. being thus derived from approximately 50 g. of mucosa. The effects of this fraction on the blood picture of two illustrative cases of pernicious anæmia were as follows:—

Case 23. [5 g. of fraction P5 (mucosa) daily for first 12 days, then 2 g. daily.] Maximum reticulocyte response: 59·7 per cent. on the tenth day of treatment.

Day of treatment.

1st	R.B.C. 1,256,000	....	Hb. 35 per cent.
22nd	R.B.C. 3,232,000	....	Hb. 67 ,,

Case 305. [5 g. of fraction P5 (mucosa) daily.] Maximum reticulocyte response: 30·1 per cent. on the ninth day of treatment.

Day of treatment.

1st	R.B.C. 1,952,000	....	Hb. 41 per cent.
19th	R.B.C. 3,168,000	....	Hb. 68 ,,

II.—EFFECT OF FRACTIONS P5 (I) AND P5 (II)

When fraction P5 was dissolved in dilute hydrochloric acid and the solution was precipitated with acetone, a fraction P5A was obtained which, though active peptically, was quite inactive in the treatment of pernicious anæmia. The use of acetone in fractionation experiments has

therefore been avoided, since it appears to inactivate hæmopoietin.[3]

A fractionation of fraction P5, however, has been achieved in the following way. The solution in dilute hydrochloric acid was brought up to pH=4·2, when there was a precipitate of fraction P5 (i), which appeared to contain most of the pepsin. This fraction, though highly active peptically, was inactive hæmopoietically, a case of pernicious anæmia receiving 7·5 g. daily for 24 days showing no improvement in the blood picture.

The filtrate from fraction P5 (i), after adjustment to pH=6·2 and precipitation with alcohol, yielded a hæmopoietically active fraction P5 (ii). The chemical details of manipulation are described elsewhere.[3]

Fraction P5 (ii) was practically free from pepsin, but administration to two patients with pernicious anæmia in daily doses of 5 g. showed that it possessed considerable hæmopoietic activity; thus in Case 295 the reticulocytes gave a peak of 26·7 per cent. on the eighth day of treatment, followed subsequently by rapid rises in the red cell count and hæmoglobin.

III.—THE INACTIVATION OF FRACTION P5 BY HEAT

Five grammes of fraction P5 and 100 c.cm. of water were heated to 60–65° C. for half an hour, cooled and administered daily for ten days to Case 351. There was no hæmopoietic response. Since a daily dose of 5 g. of fraction P5 is very active in the treatment of pernicious anæmia, it is evident that heating to 60–65° effectively destroys the activity of hæmopoietin. The peptic activity was also destroyed under these particular conditions.

Incubation of Beef with the Stomach Fractions

Incubation experiments were carried out as follows: minced lean beef-steak was added to the experimental fraction in tap water, and after thorough mixing was incubated at 37° C. with occasional stirring. All the incubation mixtures had a slightly acid reaction. For example, in experiment VIII.*b* a small portion of the clear filtered liquid had pH=5·7 at the beginning, after four hours and after six hours incubation. Originally we used the crude stomach press juice fractions, but the following experiments have been carried out with fraction P5 or more purified products derived from it.

IV.—INCUBATION OF BEEF WITH FRACTION P5 (MUCOSA)

The material resulting from the incubation of a mixture of 100 g. of beef, 2 g. of fraction P5 (mucosa), and 120 c.cm. of water for two hours was given to Case 343 daily. An extremely good response was obtained, the reticulocytes rising to the very high maximum of 62·2 per cent. on the fifteenth day of treatment, thereafter gradually falling to normal values. There were also rapid rises in the red cell count and hæmoglobin percentage:—

Day of treatment.			
4th	R.B.C. 1,130,000	Hb. 24	per cent.
14th	R.B.C. 1,990,000	Hb. 52	„
28th	R.B.C. 3,700,000	Hb. 60	„

Since 2 g. of fraction P5 (mucosa) alone would have given a much smaller response, it is evident that incubation of this fraction with beef caused a very marked increase in hæmopoietic activity.

V.—INCUBATION OF BEEF WITH FRACTION P5 (I)

(*a*) Case 345 received daily for ten days the material resulting from the incubation of a mixture of 100 g. beef, 5 g. of fraction P5 (i), and 120 c.cm. water for two hours. There was no hæmopoietic response.

(*b*) Case 357 received daily for twelve days a similar product, but incubated for three hours instead of two hours. There was no hæmopoietic response. This case was subsequently used in experiment VIII.*b*.

The negative results obtained in experiments V.*a* and V.*b* further demonstrate the inactivity of fraction P5 (i), and since it consists very largely of pepsin confirms the previous observations that the incubation of beef muscle and pepsin also yields a hæmopoietically inactive product.

VI.—INCUBATION OF BEEF WITH FRACTION P5 (II)

A mixture of 100 g. of beef, 2 g. of fraction P5 (ii), and 120 c.cm. of water was incubated for two hours and given daily for fifteen days to Case 350. There was a definite reticulocyte peak of 11·2 per cent., and slow improvement of red blood-cells, indicating some hæmopoietic activity of the product.

VII.—EFFECT OF HEATING FRACTIONS P5 AND P5 (MUCOSA) BEFORE INCUBATION WITH BEEF

(*a*) A mixture of fraction P5 (5 g.) and water (200 c.cm.) was heated to 60–65° C. for half an hour to inactivate the hæmopoietin, and then incubated for six hours with 150 g. of beef. The strained juice was given daily for eight days to Case 372 without hæmopoietic response.

(*b*) A mixture of 2·5 g. of fraction P5 (mucosa) and water (200 c.cm.) was heated to 60–65° C. for half an hour to inactivate the hæmopoietin and then incubated for six hours with 150 g. of beef. The strained juice was given daily to Case 368 for twelve days without hæmopoietic response. Thus it is clear that the hæmopoietic activity of these stomach fractions is destroyed by heating to 60–65° C. for thirty minutes.

VIII.—INCUBATION OF BEEF WITH FRACTION P5 FOLLOWED BY ENZYME INACTIVATION

(*a*) Beef (100 g.), fraction P5 (5 g.), and water (120 c.cm.) were incubated for two hours at 37° C., heated to 60–65° C. for half an hour to inactivate any remaining hæmopoietin and cooled. The product was given daily to the previously used Case 351 for a further twelve days. There was a definite reticulocyte peak of 18·2 per cent. on the eighth day, indicating some activity in the product. Better results were obtained when the time of incubation was increased as in the next experiment.

(*b*) A mixture of beef (150 g.), fraction P5 (5 g.), and water (200 c.cm.) was incubated for six hours at 37° C., heated to 60–65° C. for half an hour, cooled, filtered, and the clear liquid given daily to Case 357. A good response was obtained, the reticulocytes rising to a maximum of 22·4 per cent. on the ninth day of treatment. There were also rapid rises in the red cell count and hæmoglobin.

Day of treatment.			
3rd	R.B.C. 1,440,000	Hb. 35	per cent.
22nd	R.B.C. 2,440,000	Hb. 64	„

These results are shown graphically in the accompanying Figure.

IX.—ACTIVE INTRAMUSCULAR PREPARATION FROM EXPERIMENT VIII.*b*

A product similar to that described in experiments VIII.*a* and VIII.*b* was prepared in a form suitable for injection. Since a product similar to or identical with the "liver active principle" appears to be formed in these experiments, the method used was similar to that used for obtaining a fraction containing the liver active principle from liver extracts suitable for intramuscular injections.

A mixture of 4 kg. of beef, 80 g. of fraction P5, and 4 litres of water was incubated at 37° C. for six hours. After heating to 60–65° C. for half an hour in order to destroy the excess hæmopoietin and leave only such "liver active principle" that may be formed, the clear liquid was treated with alcohol to a concentration of 70–75 per cent. and filtered from the large protein precipitate. A light brown solid (43 g.) was obtained on working this filtrate up in the usual manner. It did not possess any appreciable blood-depressant properties.

This product (SI1) dissolved in the minimum amount of water and sterilised by filtration through a Seitz filter when given intramuscularly to Case 370 over twelve days produced a reticulocyte peak of 19·1 per cent., and there were excellent increases in the red cell count (from 1,160,000 to 2,500,000) and hæmoglobin percentage (from 31 per cent. to 74 per cent.) without further treatment. This response was more striking than it would appear from the figures, since the patient during a control period of fourteen days was in a very severe and progressive relapse, losing 700,000 red blood-cells per c.mm. in fourteen days.

Discussion of Incubation Experiments

The results of the above incubation experiments are summarised in Table I., which shows the hæmopoietic activity of various hog's stomach fractions alone and when incubated with beef under varying conditions. Inspection of this Table reveals a number of features of fundamental interest and importance. It will be noticed that we have demonstrated that although hæmopoietin in the form of the relatively crude fractions P5, P5 (mucosa), or P5 (ii) is active in the treatment of pernicious anæmia, the activity is destroyed on heating with water to 60–65° C. for half an hour. Moreover, control experiments showed that beef taken alone is inactive, and that it is also inactive when incubated with fraction P5 or fraction P5 (mucosa) which had previously been inactivated by heating to 60–65° C. with water. If, however, a mixture of an hæmopoietin-containing fraction [P5, P5 (mucosa), or P5 (ii)], beef, and water is incubated at 37° C. an active product is obtained, *the activity of which is no longer destroyed by heating to 60–65° C. for half an hour.* In other words, during the incubation the heat-labile active hæmopoietin has been converted into or has produced a hæmopoietically active product that is now heat-stable. The conclusion seems to be justifiable that the hæmopoietin has acted on a constituent in beef muscle and produced another substance similar to or identical with the relatively heat-resistant "liver active principle" itself. This represents a synthesis of the latter from beef protein and the gastric enzyme, hæmopoietin, *outside the body.* If the liver active principle is really present in the above incubation mixture, it should be possible to obtain similar hæmopoietic responses more readily by injection than by mouth. This we have successfully accomplished. Stomach preparations have not been given successfully parenterally, since it is not possible to remove proteins from the preparations without removing hæmopoietin. Active liver preparations, however, can be easily freed from the bulk of the inert protein material.

The product of the incubation of fraction P5, beef, and water was therefore heated to 60–65° for half an hour to destroy hæmopoietin and after removal of proteins worked up into a product containing the "liver active principle" suitable for intramuscular injection. This was hæmopoietically active when tested clinically.

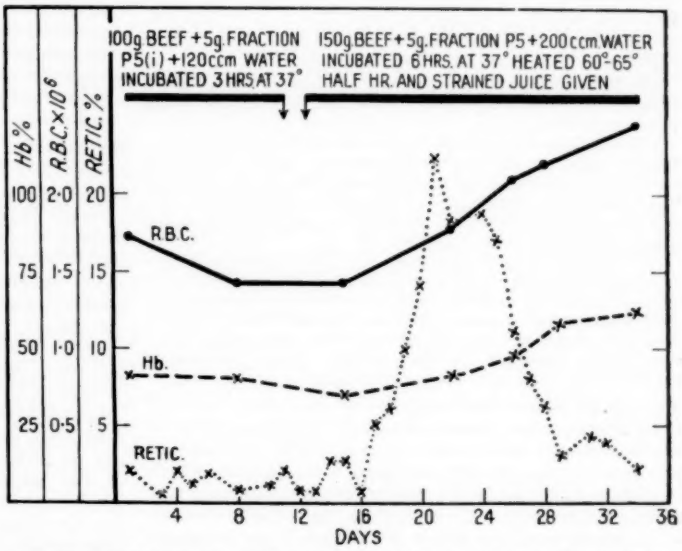


Chart showing behaviour of hæmoglobin, red blood-cells, and reticulocytes in a patient under treatment with incubated beef and stomach extracts.

TABLE I.—*Showing Responses in Cases of Pernicious Anæmia to Various Stomach Fractions and Incubation Mixtures*

Hæmopoietically active.	Hæmopoietically inactive.
Fraction P5 alone.	Fraction P5 (i) alone.
Fraction P5 (mucosa) alone.	Beef and water alone.
Fraction P5 (ii) alone.	Beef + pepsin + water incubated at 37°.
Fraction P5 or P5 (mucosa) incubated with beef + water at 37°.	Fraction P5 + water heated 60–65° half an hour.
Fraction P5 (ii) + beef + water incubated at 37°.	Fraction P5 or P5 (mucosa) + water heated 60–65° half an hour and then incubated with beef at 37°.
Fraction P5 + beef + water incubated at 37°, then heated 60–65° half an hour.	Fraction P5 (i) + beef + water incubated at 37°.
Fraction P5 + beef + water incubated at 37°, then heated 60–65° half an hour, and filtrate worked up for parenteral administration.	

Peptic Activities of Preparations from Hog's Stomach

One of us (Wilkinson [4]) has shown that the pepsin content of desiccated preparations of hog's stomach usually runs parallel to the hæmopoietic activity, since any conditions which inactivate pepsin during the desiccation process also appear to destroy the very sensitive hæmopoietin. Peptic activity determinations have therefore been carried out on all our fractions, using a modification of the well-known egg-albumin method.

TABLE II.—*Showing Peptic and Hæmopoietic Activities of Fractions from Hog's Stomach*

Preparation or fraction.	Time taken to digest egg-albumin.	Effect on cases of pernicious anæmia.
Scale pepsin	2–3 min.	Not active.
Fraction P5 (mucosa) ..	4–5 ,,	Active.
,, P5 (i)	4–5 ,,	Not active.
,, P5	7 ,,	Active.
,, P5A	9 ,,	Not active.
Desiccated hog's stomach	10–12 ,,	Active.
Fraction P5 (ii) ..	40 ,,	,,

Reference to Table II. shows that in the cases of the more highly purified stomach fractions peptic activity and hæmopoietic activity do not necessarily go hand in hand. For example, fractions P5 (i) and P5A are strongly active peptically, but inactive hæmopoietically, whilst, on the other hand, fraction P5 (ii) has strong hæmopoietic activity but contains very little pepsin. Moreover, the experimental evidence that the active principle in hog's stomach is not pepsin is conclusive.[5 6 7]

Conclusions

The experiments described in this paper confirm the evidence previously put forward [2 3] that the anti-anæmic principles in hog's stomach and in liver are not identical, and that the stomach active principle, hæmopoietin, acting on some substance present in protein food, produces a hæmopoietically active thermostable substance similar to or identical with the liver active principle.

The chief differences between the two active principles can be summarised as follows :—

(1) Hæmopoietin cannot be extracted from hog's stomach by methods which yield active extracts when applied to liver.

(2) Hæmopoietin is precipitated with the proteins when alcohol is added to hog's stomach press juice so as to give an alcoholic concentration of 70–80 per cent.[2 3] The liver active principle, on the other hand, is always found in the filtrate obtained after the removal of proteins with alcohol of this concentration.[1]

(3) Hæmopoietin differs from the liver active principle in being extremely sensitive towards heat and chemical treatment. For example, solutions of the liver active principle can be concentrated in vacuo at 60° C. for prolonged periods, or even boiled for a few minutes without very great loss of activity. Under these conditions hæmopoietin is completely inactivated.

These and other similar facts led us to the view [2 3] that hæmopoietin might possibly be of the nature of an enzyme. Confirmation of this view is found in the incubation experiments just described, in which it is shown that the incubation of heat-labile active stomach fractions with beef gives rise to hæmopoietically active material which is now relatively resistant to heat. These experiments find a counterpart in those of Castle and his co-workers,[5] who found that normal human gastric juice, when predigested in vitro with the proteins of beef muscle, was able to induce remissions in cases of pernicious anæmia. It was suggested, therefore, that there was an "intrinsic" factor of an enzyme nature in normal gastric juice which, reacting with the proteins of beef muscle (the extrinsic factor), gave rise to active material. One of us (Wilkinson [7]) has, moreover, shown that when normal gastric juice is given *with protein food* —e.g., beef—to patients suffering from pernicious anæmia, a reticulocyte response does occur, although the juice is quite inactive when administered alone. It appears that gastric juice though inactive when given alone is active (*a*) when incubated in vitro with protein food or (*b*) when administered orally with protein food.

The hypothesis has, therefore, been put forward that pernicious anæmia is due to a deficiency in the gastric juice or gastric mucosa of an unidentified substance of an enzyme nature. We have already previously termed this substance "hæmopoietin," [2 3] and there seems to be every reason for believing that it may be identical with Castle's "intrinsic" factor. Hæmopoietin is only of value when it is allowed to interact with a substance that is present in gastric muscularis and is also a constituent of beef muscle. Strauss and Castle [8] have recently suggested that this "extrinsic factor" is possibly vitamin B_2, since they found that autolysed yeast (Vegex or Marmite) when incubated with normal gastric juice gives rise to hæmopoietically active material. This conclusion, however, is invalidated by the fact that several workers,[9 10 11] including ourselves, have obtained responses in cases of pernicious anæmia by the use of marmite *alone*. Moreover, Wills and Naish[12] have shown that when an extract of egg white rich in vitamin B_2 is incubated with gastric juice, no response is obtained. Evidently the extrinsic factor and vitamin B_2 are not identical. Wills [13] has also shown that marmite (but not brewer's yeast extracts or dried yeast) is active in the treatment of tropical and other macrocytic anæmias, which resemble pernicious anæmia in responding to liver preparations. The hæmopoietic factor in marmite appears to be soluble in water and in 80 per cent. alcohol, and to be heat-stable. In these properties it resembles the liver active principle rather than hæmopoietin, and from our present knowledge there seem to be very good reasons for considering the possible identity of the hæmopoietic factor in marmite and the liver active principle.

The following relationship between the active anti-anæmic principles in stomach and liver is suggested as a result of our incubation experiments in part described in this paper :—

Enzyme.		Substrate.		End-product.
Hæmopoietin, the stomach active principle (Castle's intrinsic factor).	+	Unknown constituent of beef or gastric muscle (Castle's extrinsic factor).	→	Liver active principle.

The distribution of these three factors in various natural and artificial products is now under investigation.

The almost invariable association of pernicious anæmia with deficient enzyme secretion (achylia gastrica) [14] harmonises with the above scheme. Moreover, complete or partial removal of the stomach has been followed in a few of the cases reported [15] by an anæmia of the pernicious type.

The superiority of the hog's stomach treatment over oral liver therapy is also readily accounted for by the above scheme, since an active dried stomach preparation contains the enzyme, the substrate, and possibly the end-product of their interaction.

Finally, it is interesting to note that whilst the livers obtained from various omnivorous, carnivorous, and herbivorous animals and fishes (but not those obtained from patients dying from pernicious anæmia) have approximately the same therapeutic value in the treatment of pernicious anæmia, stomachs from herbivorous animals do not appear to possess any marked hæmopoietic activity, and are unsuitable for the treatment of pernicious anæmia.[7]

Summary

1. The preparation of various concentrates containing hæmopoietin, the active anti-anæmic substance in hog's stomach, is described.

2. Evidence that hæmopoietin is much more unstable than, and has different properties from, the active anti-anæmic principle in liver is reviewed.

3. When stomach fractions containing the thermolabile hæmopoietin are incubated with beef or stomach muscle, hæmopoietically active material is obtained which is relatively heat-resistant. These experiments are considered to effect in vitro the synthesis of a substance similar to or identical with the liver active principle.

4. It is therefore considered that the enzyme hæmopoietin by acting on some substance present in protein food—e.g., beef—may produce in vivo a substance which is stored as the active principle found in liver until it is required for red cell formation.

5. Hæmopoietin is present in the normal stomachs of man, carnivorous animals, and omnivorous animals, but has not been found in the stomachs of herbivorous animals.

6. The available evidence goes to show that true pernicious anæmia is a type of deficiency disease characterised by the absence from the gastric secretion of a specific enzyme, hæmopoietin, in addition to the pepsin and hydrochloric acid.

7. The evidence for the enzyme nature of hæmopoietin is based on (*a*) experiments with gastric juice; (*b*) incubation experiments involving the action of the thermolabile hæmopoietin on an extrinsic substrate (beef or stomach muscle) giving a relatively heat-resistant product similar to or identical with the active liver principle; (*c*) the invariable association of pernicious anæmia with deficient enzyme secretion; (*d*) the difficulty of extracting hæmopoietin from stomach tissue; (*e*) its apparent destruction by the prolonged action of pepsin and trypsin; (*f*) its association with the protein fraction of stomach press juice; (*g*) its instability; and (*h*) its sensitiveness to chemical treatment and heat.

We again acknowledge the willing coöperation and help of our University and Infirmary colleagues throughout this work; of Messrs. Boots Pure Drug Co., Ltd., of Nottingham, for generously making and supplying in quantity at our request various products and fractions; and of the Medical Research Council for a grant that has enabled one of us (L. K.) to take part in this work, which is being continued.

Addendum.—Since this paper was submitted for publication, Fouts and Zerfas [16] have reported that the potency of liver is increased by incubation with fresh stomach tissue. This is readily explained on the basis of our experiments described above, since the hæmopoietin present in the gastric mucosa finds its necessary substrate in the fresh gastric and liver tissues.

REFERENCES

1. Cohn, E. G., Minot, G. R., and co-workers: Jour. Biol. Chem., 1927, lxxiv. (Proc.), lxix; 1928, lxxviii., 325; 1930, lxxxvii. (Proc.), xlix.
2. Wilkinson, J. F., and Klein, L.: THE LANCET, 1932, i., 719.
3. Klein, L., and Wilkinson, J. F.: Biochem. Jour., 1933, xxvii., 600.
4. Wilkinson, J. F.: Brit. Med. Jour., 1932, i., 325.
5. Castle, W. B., and co-workers: Amer. Jour. Med. Sci., 1929, clxxviii., 764; 1930, clxxx., 305; 1931, clxxxii., 741.
6. Castle, W. B.: Proc. Roy. Soc. Med., 1929, xxii., 1214.
7. Wilkinson, J. F.: Brit. Med. Jour., 1930, i., 236; 1931, i., 85; Klin. Woch., 1931, x., 795; Proc. Roy. Soc. Med., 1931, xxiv., 948; 1933, xxvi., 632; Clin. Jour., 1931, lx., 133.
8. Strauss, M. B., and Castle, W. B.: THE LANCET, 1932, ii., 111.
9. Davidson, L. S. P.: Ibid., 1932, ii., 919.
10. Goodall, A.: Ibid., 1932, ii., 781.
11. Ungley, C. C.: Ibid., 1932, ii., 867.
12. Wills, L., and Naish, A.: Ibid., 1933, i., 1286.
13. Wills, L.: Ibid., 1933, i., 1283.
14. Wilkinson, J. F.: Quart. Jour. Med., 1932, i., 361.
15. ,, ,, : Ibid., 1933, ii., 281.
16. Fouts, P. J., and Zerfas, L. G.: Jour. Amer. Med. Assoc., 1933, ci., 188.

PARENTERAL ACRIFLAVINE IN THE TREATMENT OF GONORRHŒA

BY E. HUGHES, M.B. LIVERP., D.P.H.

ASSISTANT MEDICAL OFFICER OF HEALTH, WEST BROMWICH; LATE MEDICAL OFFICER, VENEREAL DISEASE DEPARTMENT, ROYAL INFIRMARY, LIVERPOOL; AND

C. ALLAN BIRCH, M.D. LIVERP., M.R.C.P. LOND., M.M.S.A., D.P.H.

HONORARY ASSISTANT PHYSICIAN, ROYAL INFIRMARY, WIGAN; ASSISTANT MEDICAL OFFICER, SEAMEN'S DISPENSARY, LIVERPOOL; LATE SENIOR MEDICAL REGISTRAR, ROYAL INFIRMARY, LIVERPOOL

THE flavines are a group of synthetic dyestuffs whose therapeutic properties were first discovered by Ehrlich, the best known of them being acriflavine or 3·6 di-amino-methyl-acridinium chloride. This dye has been extensively used as a bactericidal agent and has been given by mouth and by subcutaneous or intramuscular injection in addition to being used as an external application. Although it has been used as an irrigating fluid, and also by mouth, in the treatment of gonorrhœa, it is only comparatively recently that records of its parenteral administration have been made. It was, nevertheless, used as long ago as 1921 in Liverpool by the late Dr. F. P. Wilson, but was abandoned because intravenous injections led to a high incidence of thrombosis.

Browdy [1] in 1921 treated several cases of gonorrhœa with 200 c.cm. of a 1 in 1000 solution of acriflavine intravenously, and reported seven days' cures with no relapses and no adverse symptoms. More recently Murray,[2] using 5 c.cm. of a 5 per cent. solution intravenously, found that it produced no better results than older methods, and in certain cases caused liver damage.

During the last 12 months over a hundred male patients with acute gonorrhœa have been treated at the Liverpool Royal Infirmary with subcutaneous or intravenous injections of acriflavine. Many patients, however, ceased to attend hospital before they were completely cured, so that the following account deals with 50 cases only. We ourselves have abandoned flavine therapy owing to certain toxic effects, but it is hoped that other workers will record their experiences with this drug, so that the mass of facts obtained will enable an accurate estimate of its value to be formed.

The drug used was neutral acriflavine, and it was first given subcutaneously; 1 to 3 c.cm. of solutions in sterile water varying from 1 to 5 per cent. all produced local pain when administered "deep subcutaneously" by a careful technique in which the needle was plunged into the gluteal muscles and then withdrawn slowly with a skew motion until it was felt to "click" as the point emerged from the capsule of the muscle, at which point the drug was injected. A solution of acriflavine in isotonic glucose also produced pain. One patient developed an intractable abscess in the buttock, and in another patient the site of injection broke down about two months later. Because of these local ill-effects we later gave acriflavine intravenously, using 10 c.cm. of a 1 per cent. solution three times a week. Our object was to keep the patient continuously under the influence of acriflavine, but in some cases, owing to irregular attendance, it was not possible to administer the drug regularly.

Most patients showed no ill-effects, but sometimes vomiting, a feeling of fullness in the throat, and a burning pain in the rectum were noted immediately after the injection. Two cases showed a profuse blotchy rash about 36 hours after the first two injections. The delayed toxic effects are described later.

SUMMARY OF RESULTS

The 50 cases were all treated until apparently cured, i.e., until—

(1) The discharge had ceased even after instrumentation.

(2) The prostate was normal in size, and the "prostatic bead" contained either no pus cells or a very occasional pus cell only.

(3) The urethra was normal on urethroscopy.

The average duration of attendance of all cases was 116 days, the shortest being 12 days (having had 0·275 *g.* of acriflavine) and the longest being 273 days (having had 0·65 g. of acriflavine). The average amount of drug given was 0·66 g., and the maximum 1·62 g. All cases had, in addition to acriflavine, irrigation with potassium permanganate, 1 in 8000, and potassium citrate by mouth, but no vaccines. A few cases had a restricted fluid intake with a view to concentrating the acriflavine in the urine. The average duration of treatment in these cases was 91 days.

Complications.—Three patients developed acute unilateral epididymitis when on treatment with acriflavine. Details of these cases are as follows:—

(1) Developed epididymitis 58 days after onset of disease, having received 1·62 g. acriflavine; 30 days later the epididymis was normal, but 221 days after onset he still had an occasional pus cell in his "prostatic bead." This patient attended irregularly.

(2) Developed epididymitis 29 days after onset of disease, having received 0·7 g. acriflavine; 18 days later the epididymis was normal, but 142 days after the onset he still had pus cells in his "prostatic bead."

These two cases are not included in the 50 cases referred to above because they are at the time of writing not completely cured.

(3) Developed epididymitis 57 days after onset of disease, having received 0·445 g. acriflavine. He received 0·2 g. acriflavine after this complication arose. Epididymitis disappeared after 77 days, and 210 days after the onset he was apparently cured.

There were no cases of acute suppurative prostatitis. Three patients had acute gonococcal arthritis of the wrist when they commenced treatment, and took 190, 187, and 126 days respectively before the joint condition and urethritis were cured. We have observed that when acriflavine is beneficial the discharge ceases very quickly, but it tends to recur and the total duration of treatment is not reduced. This effect appears to be most marked when the drug is given deep subcutaneously. A combination of subcutaneous and intravenous therapy seems to offer no advantage.

Delayed toxic effects.—In two cases jaundice occurred.

(1) Aged 20. Total acriflavine given, 0·825 g. (0·175 g. by deep subcutaneous injection and remainder intravenously). Urethritis cured in 101 days. Jaundice appeared 133 days after the last injection of acriflavine and lasted 22 days. The patient had the general symptoms of a catarrhal jaundice. The skin was deeply pigmented but there was no itching. Bile-pigments were present in the urine and the stools were pale. There was no pyrexia. The van den Bergh test showed a prompt direct reaction and a quantitative reading of 4 units. The liver and spleen were definitely enlarged and the enlargement gradually disappeared as the jaundice cleared. Wasserman reaction negative.

(2) Aged 32. Total acriflavine given, 0·9 g. (all intravenously). Jaundice appeared 93 days after last injection of acriflavine and lasted 60 days. Urethritis not completely cured when last seen. (This patient is not included in the above series of 50 cases.) Jaundice had been present about a week before the liver was enlarged. The spleen was not palpable. Three weeks after the onset of jaundice the van den Bergh test showed a direct positive reaction and a quantitative reading of 5 units. The lævulose-tolerance test was normal at a time when the jaundice was marked.

In both these cases the severity of symptoms and their duration were more marked than in the average case of catarrhal jaundice, and constitutional disturbance was considerable.

In many cases slight yellow tinting of the skin occurred very soon after intravenous administration of acriflavine, and was presumably due to the acriflavine in the blood stream. We did not notice any staining of the conjunctiva. It was found that a solution of acriflavine containing 0·00025 g. in 100 c.cm. was approximately as yellow as normal blood plasma. We used no chemical test for acriflavine in blood-serum, but it was noted by one of us (E. H.) that in the second case the blood-serum was definitely fluorescent 117 days after the last injection. It would appear, therefore, that in acriflavine jaundice the drug remains in the blood for a long period. In cases with no liver damage the maximum period at which fluorescence was observed in the serum after injection of 0·1 g. was five days. In many cases it had disappeared in 48 hours. Jaundice also occurred in a case of mixed syphilitic and gonococcal infection seven days after the last injection of neokharsivan (total 5·25 g.). Two acriflavine injections (total 0·2 g.) had also been given between the seventh and eighth injections of neokharsivan on account of a relapse of gonorrhœa which had not been treated originally with acriflavine. This was the only case in our series in which neokharsivan and acriflavine were both administered.

It appears from the above cases that acriflavine must be added to the long list of substances which may damage the liver. The causal relationship between acriflavine and jaundice is supported by the evidence of Murray,[2] who found a much higher incidence of jaundice of a catarrhal type in patients under treatment with acriflavine than in a control series.

The liver damage might be lessened by the administration of glucose by mouth before each injection of acriflavine. Repeated quantitative van den Bergh reactions during treatment will detect jaundice when latent, so that the drug can be discontinued before clinical jaundice appears. The icterus index of the blood plasma is an easier (if less accurate) means of measuring bilirubinæmia, but the yellow coloration due to acriflavine makes the test unreliable in these cases.

CONCLUSIONS

(1) Acriflavine given by deep subcutaneous injection will cause urethral discharge to disappear quickly but relapses are common and local pain at the site of injection makes it unsuitable for use in an outpatient clinic.

(2) Acriflavine therapy is not without danger. Jaundice is apt to appear after a long latent period. Deep subcutaneous injection may lead to local pain and abscess formation.

(3) Acriflavine appears to lessen the incidence of complications, but has no beneficial effect when these are established.

We are indebted to Mr. R. Stopford-Taylor for permission to record these findings.

REFERENCES

1. Browdy, M. W.: Practitioner, 1921, cvii., 264.
2. Murray, D. H.: Jour. Roy. Army Med. Corps, 1930, liv., 19.

THE VALUE OF THE MENINGOCOCCAL COMPLEMENT-FIXATION TEST

A SEROLOGICAL STUDY OF ONE HUNDRED CASES WITH SYMPTOMS OF MENINGITIS

BY H. A. COOKSON, M.B., F.R.C.S. EDIN., D.P.H.

HON. PATHOLOGIST, ROYAL INFIRMARY, SUNDERLAND; PATHOLOGIST TO SUNDERLAND MUNICIPAL HOSPITAL; BACTERIOLOGIST, COUNTY BOROUGH OF SUNDERLAND; AND

J. ELLIOTT SINCLAIR

LABORATORY TECHNICIAN, SUNDERLAND ROYAL INFIRMARY

THE continued occurrence of fairly numerous cases of cerebro-spinal fever makes it desirable to investigate all possible methods of diagnosis; this is sometimes difficult in the septicæmic and abortive forms where the cerebro-spinal fluid may be sterile and may even show a normal cytology.

In a previous communication from this department [1] an attempt was made to estimate the value of the complement-fixation test as an aid to diagnosis in meningococcal infections. Sera from 34 known cases of cerebro-spinal fever were tested, as well as 125 sera derived from other (non-meningitic) cases. The results corresponded almost exactly with the diagnosis arrived at by other means. It was felt, nevertheless, that the practical utility of the test could be gauged better by employing it in a series of consecutive cases, initially diagnosed as "meningitis," than by selecting known positives and negatives. Our purpose now is to present the results obtained in 100 such cases, in all of which the diagnosis of cerebro-spinal fever had to be considered or was definitely made.

The technique used for the test was that of the standard Wassermann reaction (No. 1 in the Medical Research Council's Special Report Series No. 14), as in the previous series. A modification of the method of preparing the antigen was, however, introduced: instead of using a mixed suspension of local strains of meningococci as before, all four types were included in known proportions. A saline suspension of pure cultures was used, containing in each cubic centimetre 90 million type III., 60 million type I., and 50 million each of types II. and IV.—a total of 250 million cocci per c.cm. The reason for using a preponderance of type III. was the prevalence of infections of this type in recent cases and in a previous epidemic in this district.

Of the 100 consecutive sera tested with this antigen, 43 gave varying degrees of complement fixation. Only 1 of these could be regarded as a false positive, this being a case of cerebellar tumour (tuberculoma) without evidence of meningococcal infection; there was, however, no opportunity to examine the nasopharynx for meningococci. The other 42 cases giving positive complement-fixation tests were all diagnosed clinically as cerebro-spinal fever, which was confirmed in 33 of them by finding the meningococcus in the cerebro-spinal fluid; of the others not thus confirmed, all but 3 showed a polymorphonuclear exudate in the cerebro-spinal fluid, but the organism could not be found.

There were 57 sera which gave no complement fixation whatever; in 28 of these the initial diagnosis of possible cerebro-spinal fever was supported neither by the clinical progress nor by the findings in the cerebro-spinal fluid. Of the remainder, 15 were proved to be cases of meningitis due to organisms other than the meningococcus—tuberculous, streptococcal, pneumococcal, and influenzal cases. We are left with 14 cases, clinically typical of cerebro-spinal fever, with polymorphonuclear exudates in the theca, in 7 of which meningococci were found but which gave no complement fixation. The negative result in 8 of these 14 cases may be attributable to the fact that the blood was taken during the first three days of illness. Therefore, out of 56 cases clinically and otherwise definitely suffering from cerebro-spinal fever, 42, or 75 per cent., showed complement fixation with a meningococcal antigen.

There were 3 cases in this series clinically typical of meningococcal meningitis, in which the cerebro-spinal fluid was clear and contained neither organisms nor excess of cells; the positive complement-fixation test was the only laboratory confirmation available. It is in such cases, where the meningitis is confined to the base of the brain, and in septicæmic, abortive, and relapsing cases, that this test is likely to prove of most value in diagnosis. Many of the cases of so-called "aseptic meningitis" would probably be found to give positive meningococcal complement-fixation reactions.

[1] Cookson, H. A., and Thorp, E.: Edin. Med. Jour., 1932, xxxix., 258.

SUMMARY

1. Complement fixation with meningococcal antigens appears in the serum of at least 75 per cent. of cases of cerebro-spinal fever.

2. In a few cases where examination of the lumbar puncture fluid is negative or where none can be obtained, the complement-fixation test may be of great value in the diagnosis of meningococcal infections.

3. A positive reaction in a case with meningeal symptoms is practically diagnostic of a meningococcal infection; a negative reaction, however, does not necessarily exclude this.

We wish to thank Dr. A. S. Hebblethwaite, medical officer of health for Sunderland, and Dr. E. Thorp, medical officer at the Sunderland Fever Hospital, for the use of material from the cases under their care; and Dr. W. M. Scott, of the Ministry of Health, for much valuable assistance in the typing of cultures.

TUBERCULOUS MENINGITIS IN ADULTS

A REVIEW OF TWENTY-NINE CASES

BY A. HILLYARD HOLMES, M.D. MANCH., M.R.C.P. LOND.

HONORARY ASSISTANT PHYSICIAN, MANCHESTER ROYAL INFIRMARY; VISITING PHYSICIAN, WITHINGTON HOSPITAL, MANCHESTER

TUBERCULOUS meningitis is much more common in children than in adults. Descriptions of the condition in medical text-books rarely differentiate between the symptoms seen in young children and those seen in older patients better able to describe their symptoms and to coöperate in the examination. The literature of the subject contains very few papers dealing with the disease in adults, those of Warrington [1] and Murray [2] standing almost alone. Warrington drew attention to the invasion symptoms in adults and Murray to the characteristics of the cerebro-spinal fluid. It was Warrington's paper, and the fact that 15 of these 29 cases were seen during the two years 1929–30, that suggested the present review. No preconceived intensive study according to any scheme has been attempted; the cases are reviewed on the basis of personal observation during routine hospital and private work.

The diagnosis was confirmed in every case either by finding tubercle bacilli in the cerebro-spinal fluid during life or by post-mortem examination. No patient recovered. No attempt was made to determine whether the bacilli were of human or bovine type.

Of the 29 cases, 21 occurred between the ages of 15 and 30. The youngest patient was 15 and the oldest was 50, the average age being 26. Between the ages of 15 and 20 there were 12 cases; from 21 to 30 there were 9 cases; from 31 to 40 there were 5 cases; and between 41 and 50 there were 3 cases. Males numbered 15 and females 14.

PROVISIONAL DIAGNOSIS

It is instructive to note the diagnoses made before or immediately after admission to hospital. Only 2 of the cases were originally diagnosed as meningitis, one on the seventh day of illness, and one on the fourteenth day. In only 6 other cases was the first

diagnosis that of some cerebral lesion, the earliest being the seventh day of illness. Two cases were sent into hospital as suffering from nervous debility, and one as a case of neurosis. Influenza was the provisional diagnosis in 7 cases, pneumonia in 2, uræmia in 2; among other provisional labels were bronchitis, pulmonary tuberculosis, pleurisy, retention of urine, gastritis, tuberculous salpingitis, and encephalitis lethargica.

CLINICAL COURSE

Early Symptoms.—The records of symptoms before admission to hospital are incomplete; rarely was there any note of the temperature or pulse, or of the day on which various symptoms appeared. During the first week of illness the order of frequency of symptoms seems to have been as follows: headache (12 cases), vomiting (8), backache (5), constipation (4), pyrexia (3). Other early symptoms included coma, delirium, strangeness of manner, general pains, drowsiness, and irritability.

Case 5, seen on the first day, had been unconscious 18 hours; death occurred on the fourth day; post-mortem examination showed hæmorrhages into the mid-brain.

Case 16, provisionally diagnosed as pneumonia and uræmia, was seen on the third day, complaining of headache, vomiting, and backache; albumin was present in the urine, which yielded a culture of *B. coli*; the blood-urea was 23 mg. per 100 c.cm.

Case 6, seen on the fourth day as a case of influenza, was strange in manner; cervical rigidity appeared on the sixth day, when tubercle bacilli were found in the cerebro-spinal fluid; the patient died the following day.

Case 23, when seen on the fifth day, showed only headache, constipation, and pyrexia; the patient lived 17 days.

Duration of Illness.—The onset of illness was uncertain in 9 cases, but reasonably certain in the remaining 20. Of these, the average duration was fourteen and a half days; 1 patient lived twenty-two days. Apart from the patient who died on the fourth day from hæmorrhages into the mid-brain, the shortest duration was seven days, and only one other patient lived less than ten days; 11 lived more than fifteen days. The longest survival after tubercle bacilli had been found in the cerebro-spinal fluid was eleven days; 7 patients survived a week or more after the diagnosis had been thus confirmed.

Temperature, Pulse, and Respiration.—The temperature was usually irregular, ranging between 97° F. and 101° F. In only 4 cases did the temperature rise above 102° F.; in 12 cases it never rose beyond 100° F.; and in 4 cases the highest temperature recorded was 99° F.

Case 4, admitted to hospital as a case of neurosis, was clinically positive on the sixth day, when the temperature was 97·4°, pulse-rate 88, and respiration-rate 22; the diagnosis was confirmed by autopsy.

A terminal rise of temperature was seen in four instances:—

Case 6 rose to 104°, although when the clinical signs and spinal fluid were positive the temperature was only 99°.

Case 13 had a maximum temperature of 100° for two weeks; on the day of death the temperature rose from 98° to 105·2°.

Case 14 showed a terminal rise to 105·4°; previously the range had been from 98° to 101°.

Case 28 had for five days a temperature of 102°–103°, which rose to 105° on the day of death.

A terminal fall of temperature was noted in four instances:—

Case 1 showed normal or subnormal temperature for 48 hours before death; previously it had reached 101·8°.

Case 2, with a maximum temperature of 101·4°, showed only 97°–99° for five days preceding death.

Case 16 showed a similar range for a week before death.

Case 19, with a maximum temperature of 101·8°, only registered 96·2° on the day of death.

The pulse-rate was only above 120 at any time in 10 of the cases; 8 cases never showed a pulse-rate higher than 100.

Case 4, when clinically and bacteriologically positive, showed a temperature of 102·6°, a pulse-rate of 76, and a respiration-rate of 20.

Case 11, when clinically positive, had a temperature of 99·2°, a pulse-rate of 56, and a respiration-rate of 20. At the post-mortem examination a frontal tuberculoma was found, with localised meningitis.

Case 12, when clinically positive, had a temperature of 100·6°, a pulse-rate of 80, and a respiration-rate of 20.

Case 28, on the eighth day, was clinically positive with a temperature of 102·6°, a pulse-rate of 76, and a respiration-rate of 20; for five days while the temperature ranged between 102° and 103°, the pulse-rate was between 80 and 104.

In only 9 cases was the respiration-rate over 30 per minute at any stage of the illness; in 9 cases it was never above 24. One case with pulmonary tuberculosis had a respiration-rate of 40; 1 with an abscess in the neck had a rate of 48; 3 cases with uncomplicated meningitis had rates of 39, 40, and 44 respectively.

Neck Symptoms.—Under this heading are included pain in the nape of the neck at rest, pain on passive flexion of the head, resistance to flexion and actual extension of the head. The phenomenon was noted in 18 cases, and was absent in 4 cases throughout the illness. The earliest record of its appearance was in Case 6, where it was noted on the fifth day. One patient survived ten days and 2 others lived nine days after rigidity of the neck appeared; in one of these (Case 7) the cerebro-spinal fluid contained tubercle bacilli a week before death. In all, 8 cases survived five or more days after cervical rigidity appeared.

Case 17 showed no neck signs on the fourteenth day, although the temperature was 102° F., and the fluid contained tubercle bacilli.

Case 10 had a flaccid neck on the day before death, yet the fluid yielded tubercle bacilli four days previously, and the patient had been in coma for those four days.

Two of the cases in which this sign was absent came to post-mortem examination: Case 3 showed no excess of fluid, and there were only very small tubercles at the base of the brain, which were scarcely noticeable; Case 11 was the one in which a frontal tuberculoma was found, with only localised adjacent meningitis.

Eye Signs.—Inequality of pupils, dilatation of both pupils, or loss of the light reaction was noted in 18 cases. The abnormal sign sometimes disappeared later in the illness. Case 7 showed dilated pupils which later became normal, and a squint which disappeared later; in Case 20 the pupils were first dilated and equal, later they were unequal, and later still they became equal again. Case 9 illustrated the disappearance of a squint. Case 28 showed dilatation of one pupil and loss of the light reflex by the fourth day; no other case showed pupillary signs before the ninth day. Strabismus, diplopia or ptosis was noted in 11 cases only, the earliest date of their appearance being the eighth day. Nystagmus was present in 2 cases, and photophobia in 3. Swelling of the optic disc or retinal congestion was observed in 6 cases.

The absence of all abnormal eye signs was noted in Case 2 on the eighth day, when the general clinical picture was positive and tubercle bacilli were present

TABLE SHOWING RESULTS IN TWENTY-NINE CASES OF TUBERCULOUS MENINGITIS IN ADULTS

Case No.	Sex.	Age.	Day first seen.	Early provisional diagnosis.	Other clinical Tb. foci.	Cerebro-spinal fluid.								Day of death.	Post-mortem findings.
						Day of exam.	Clear or turbid.	Pressure.	Coag.	Lymphocytes per c.mm.	Total protein per cent.	Glob.	Tb. bacilli.		
1	F.	17	14	..	? Lungs.	15	C.	+	..	120	..	+	+	19	—
2	M.	16	5	Bronchitis.	„	8	C.	++	..	..	..	..	+	15	—
3	F.	20	? 5	Frontal tumour.	..	? 11	C.	Normal	..	..	..	..	..	? 14	No excess of cerebro-spinal fluid. Tb. meninges and ileum.
4	F.	32	7	Neurosis.	..	No fluid obtained.								13	Tb. meninges; fluid ++.
5	F.	16	? 1	Cerebral.	Lungs, perit.	? 2	C.	+	..	3	0·12	+	−	? 4	Tb. lungs, peritoneum, meninges.
6	M.	20	4	Influenza.	Lungs.	6	C.	++	..	++	..	+	+	7	Tb. lungs, kidney, spleen, meninges.
7	M.	20	9	Cerebral tumour.	..	11	C.	..	+	185	0·2	+	+	18	Tb. lungs, kidney, spleen, glands, meninges.
8	F.	19	? 7	Influenza.	..	? 12	T.	..	..	250	0·4	+	+	? 22	—
9	F.	30	12	Pneumonia.	Lungs.	13	T.	N.	..	108	0·2	+	+	16	—
10	M.	38	? 14	Pulm. Tb.	„	? 14	T.	+	+	114	0·15	+	+	? 19	—
11	M.	24	14	Pleurisy.	„	..	..	..	..	..	..	..	..	18	Tuberculoma frontal lobe, meninges, lungs.
12	M.	25	? 10	Uræmia. ? enceph.	..	? 12	T.	++	+	140	0·125	+	+	? 14	—
13	M.	21	? 7	Influenza.	..	? 15	T.	..	+	118	0·25	+	+	? 23	—
14	F.	45	? 7	„	Neck gl.	? 10	C.	+	+	146	0·2	+	+	? 13	—
15	F.	30	14	Mening.	..	15	C.	N.	+	28	0·2	+	+	16	—
16	F.	27	3	Pneumonia. Uræmia.	..	11	T.	+	+	330	0·3	+	+	12	—
17	M.	34	14	Influenza.	..	14	T.	N.	+	239	..	+	+	19	—
18	F.	19	10	Cerebral.	..	10	T.	..	+	135	0·25	+	+	14	—
19	M.	15	7	Retention of urine.	..	9	C.	+	..	Polys. ++	..	..	+	9	General miliary Tb.
20	M.	25	7	Enceph.	..	10	T.	++	+	48	0·3	+	+	18	—
21	F.	37	? 14	Nerv. deb.	? Lungs.	? 16	C.	++	+	..	0·2	+	+	? 16	—
22 (a)	M.	41	8	Cerebral.	..	8	C.	++	..	75	0·15	..	−	..	—
(b)						11	T.	++	+	68	0·2	+	+	22	—
23	F.	16	5	Influenza.	Neck gl.	11	C.	++	+	64	0·1	+	+	17	—
24	F.	19	7	Gastric.	..	9	T.	..	O.	240	0·1	+	+	10	—
25	F.	21	?	Tb. salping.	..	No fluid obtained.								?	Salpinges, meninges, lung.
26	M.	21	7	Tb. mening.	Lungs.	No puncture made.								17	Lungs, meninges, abdominal glands.
27	M.	50	?	Cerebral. Art.-scler.	..	„		„		„				?	Tb. meninges only.
28	M.	18	8	Influenza.	..	9	C.	N.	O.	79	0·09	..	+	13	—
29	M.	39	? 13	Debility.	..	? 13	T.	..	+	26	0·16	..	+	? 22	—

in the lumbar puncture fluid; four days later the pupils were unequal. Case 7 showed no abnormal eye signs on the fifteenth day, four days after tubercle bacilli had been found in the cerebro-spinal fluid, although on the ninth day the pupils had been unequal and there had been transient diplopia. Case 25 showed complete paralysis of the left oculomotor nerve two days before death. Coma did not abolish ocular signs.

Pyramidal Signs.—Under this head are included spasticity of the limbs, increased tendon-jerks, ankle-clonus, Kernig's sign, and an extensor plantar response. Six cases showed none of these signs for periods of from one to eight days after the cerebro-spinal fluid yielded tubercle bacilli (Cases 8, 9, 10, 15, 18, and 28). Case 15 was negative in this respect on the fifteenth day of illness; Case 8 showed no pyramidal signs two days before death, which occurred presumably on the twenty-second day of illness. Case 9 showed no pyramidal signs through an illness lasting sixteen days.

The pyramidal signs were sometimes very slight when the case was clinically and bacteriologically positive; between the ninth and fourteenth days of illness 1 such case showed only slight spasticity; 2 showed exaggerated knee-jerks only, and in 4 cases only Kernig's sign was present.

Case 3 illustrated the disappearance of an extensor plantar response after it had been present for three days. No case presented all the pyramidal signs; Case 2 showed increased knee-jerks and Kernig's sign when the plantar response was flexor; Case 5 had increased knee-jerks and an extensor plantar response when there was no Kernig's sign and no ankle-clonus. Case 7 had a flexor plantar response and absent knee-jerks in the presence of spasticity and a Kernig's sign. During coma the pyramidal signs were sometimes present, sometimes absent; Cases 9 and 10 showed none during coma; Case 13 when in coma had exaggerated tendon-jerks in the legs and an extensor plantar response. Kernig's sign was very inconsistent, even though the case was clinically and bacteriologically positive; in six such cases it was absent, and in eleven it was present.

Mental Symptoms.—In all but 5 of the cases some alteration of mentality or behaviour occurred. This took the form of strangeness of manner, irritability, delirium, or apathy. These mental symptoms were

only noted within the first week of illness in 3 cases, and in 13 cases did not appear until the tenth day or later. Only 8 cases showed delirium at any stage of the illness; 6 cases evinced marked irritability; and 5 were strange in manner.

Case 3 answered sensibly and even smiled at times on the day of death. Case 7 was delirious on what appeared to be the third day of illness; at this stage she "slept all day and talked all night," which gave rise to the provisional diagnosis of encephalitis lethargica; by the ninth day she was mentally confused; on the twelfth day she was apathetic; by the fifteenth day irritability was marked; she died on the eighteenth day of illness.

Coma appeared on the day of death in ten cases; in four cases it was present the day before death; Case 2 was in coma for three days, Case 1 for four days, and Case 10 for five days.

THE CEREBRO-SPINAL FLUID

The fluid obtained by lumbar puncture was examined in 23 cases. In 3 cases lumbar puncture was not performed; in 2 cases no fluid could be obtained; and in one case the fluid, being normal in appearance and not under increased pressure, was not sent for laboratory examination. Of the 23 cases examined, 22 gave positive findings for tubercle bacilli, though 1 of these, the only case examined twice, was negative on the eighth day and positive three days later.

The earliest day on which tubercle bacilli were found was the sixth day of illness (Case 6); in Case 2 they were present on the eighth day, and Cases 19, 24, and 28 showed them on the ninth day.

In only one case were the polymorphs (91 per cent.) in excess of lymphocytes (Case 19); this was on the ninth day of illness; Case 29 showed equal numbers of polymorphs and lymphocytes; in all the other cases lymphocytes were in excess. Their number per cubic millimetre ranged from 3 in Case 5 (presumed second day of illness) to 330 in Case 16 on the eleventh day of illness; Case 15 showed only 28 on the fifteenth day; Case 20 showed 48 on the tenth day; Case 24 showed 240 on the ninth day; 12 cases gave lymphocyte counts of over 100, and of these four were over 200.

A coagulum was present in 14 of the specimens containing tubercle bacilli, and was only recorded absent in 2 such cases. The fluid was clear in 10 and turbid in 12 of the positive cases. No relation between turbidity and cell counts was indicated; clear fluids gave lymphocyte counts varying from 28 to 185, three being over 140; turbid fluids contained between 26 and 330 lymphocytes per c.mm., seven being under 140.

The total protein and the globulin contents of the fluid had no relation to turbidity; five clear and nine turbid fluids contained over 0·150 per cent. of total protein; eight clear and eleven turbid fluids showed excess of globulin. The total protein varied from 0·99 per cent. to 0·4 per cent.; 11 cases gave readings of 0·2 per cent. or more. Varying cell counts were found in the presence of equal amounts of total protein; Cases 23 and 24 each had 0·1 per cent. protein, their lymphocyte counts being 64 and 240 respectively; Cases 20 and 16 each had 0·3 per cent. of protein with lymphocyte counts of 48 and 330.

The pressure of cerebro-spinal fluid was not measured by a manometer; the rate of flow was taken as the indication of normal or increased pressure. Of the 22 cases bacteriologically positive, in 6 no record was made of the fluid pressure; in 4 it was recorded as normal; in 5 as increased; and in 7 as much increased.

Cases 6, 2, and 22 showed marked increase of pressure on the sixth, eighth, and eleventh days respectively, whereas Cases 9, 15, and 17 had a normal rate of flow on the thirteenth, fourteenth, and fifteenth days respectively. Total chlorides were estimated in two cases only: Case 28 had 0·605 per cent., and Case 29 had 0·620 per cent.; these were also the only cases in which the sugar content of the fluid was estimated, the results being 0·011 per cent. and nil.

POST-MORTEM FINDINGS

A post-mortem examination was made in 10 of the cases; all showed naked-eye evidence of tuberculous meningitis. Other tuberculous lesions were as follows: in the lungs in 6 cases, one of these being "healed"; in the spleen and kidneys in 3 cases; in each of the following sites in one instance: ileum, peritoneum, glands, brain, liver, Fallopian tubes.

Case 19 was the only example of generalised miliary tuberculosis. Case 11 showed a large mass in the left frontal lobe, over which the meninges were adherent; histological examination proved the mass to be a tuberculoma; in no other case was any cerebral lesion discovered which could have been the starting point of meningitis.

DISCUSSION

Adults rarely emit the cry of pain so frequently heard in children; instead they complain of the severe headache. They control their feelings better, and are not so irritable or fractious when handled. They rarely have convulsions or paralyses of the limbs. Retraction of the abdomen, diarrhœa, irregularity of the pulse, Cheyne-Stokes' respiration, and tâche cérébrale are less frequently present in adults. It is not rare to obtain a history of some trauma to the head in children. Schultze [3] records 11 cases from the literature in which symptoms followed within a few days or weeks of injury. From an analysis of 70 cases in children who were examined post-mortem, Paterson [4] found the average duration was twenty-one days. The present series gives the average duration in adults as fourteen and a half days; Warrington [1] found it to be between four and five weeks; Lawrason Brown [5] says it may be a few days only. Stewart [6] found cistern puncture in children as safe and easy as lumbar puncture, and much more likely to yield tubercle bacilli early in the disease. All Murray's [2] adult cases were submitted to lumbar puncture. None of the present series had cistern puncture.

Miliary tuberculosis is certainly more common in children than in adults. This review of the symptomatology in adults reveals the fact that at every stage of the disease there is great variability in signs and symptoms; this feature is emphasised by Lawrason Brown. The early symptoms are common to many conditions; those which clinically suggest meningitis, such as the ocular, cervical, and pyramidal groups, very rarely appear before the middle of the second week. For these reasons it is probable that the condition often passes undiagnosed, and that adults are affected more often than is commonly believed. The only certain method of diagnosis during life is the finding of tubercle bacilli in the spinal fluid. Other forms of meningitis depend for their exact diagnosis on the same method of examination.

Coincident lesions of known ætiology are not always present as a guide; in this series 18 out of 29 cases showed no other clinical focus of tuberculosis, though 8 of the 10 autopsies revealed other foci, 6 of them being in the lungs. Warrington [1] states that meningitis is chiefly a terminal event in chronic pulmonary tuberculosis, though only 1 of his 4 cases was known previously to have the lungs affected. Lawrason Brown [5] says that 8 per cent. of cases of tuberculosis end with meningitis, and that the meningeal lesion is usually secondary to tuberculosis elsewhere. In this

connexion the work of Rich and McCordock [7] is of great interest. By careful slicing of the brain, they found that 38 out of 40 cases of tuberculous meningitis which they examined showed tubercles elsewhere in the brain, of which 36 were in direct contact with the meninges. They failed experimentally to produce meningitis by injecting tubercle bacilli into the blood stream, but easily caused it by injecting into the subarachnoid space. They conclude that visceral tuberculosis is first spread by the blood stream to the brain, and then the meninges become involved by direct spread from caseating tubercles.

Mental symptoms were present at some stage of the illness in 24 of 29 cases in this series, rarely during the first week, usually not until the tenth day. Warrington [1] records four proved cases in folk whose ages were between 26 and 38; three were males; all four cases showed an insidious onset over three to four weeks, with slight physical and mental depression, strangeness in manner, or hysteroid attacks; then there was a sudden change, with rapidly developing coma and death within a week. Lawrason Brown [5] states that in adults the onset may be marked by a change in disposition, slow cerebration, and some affection of speech.

The cerebro-spinal fluid usually gives evidence very suggestive of tuberculous infection apart from the presence of tubercle bacilli. This consists of the formation of a clot on standing, the presence of lymphocytes in relative excess, protein to the extent of 0·2 per cent., and diminution of chlorides to about 0·6 per cent. Murray's [2] 24 cases were aged from 15 to 60, the average age being 28; by prolonged search he found tubercle bacilli in every case in the lumbar fluid. His average findings were as follows: clear fluid, clotting, protein 0·27 per cent., chlorides 0·637 per cent., cells 298 per c.mm., mostly lymphocytes. Other workers have not had such a high percentage of positive findings of bacilli; 80 to 90 per cent. is mentioned as obtainable by special methods and careful search [8]; Stewart [6] found the bacilli in 24 of 42 cases by lumbar puncture within forty-eight hours of admission to hospital, whereas by cistern puncture he obtained 100 per cent. positive results on the same children within the same time; he concluded that the estimation of chlorides was of no diagnostic value.

Comparatively few attempts have been made to determine the relative incidence of human and bovine infection. Griffith [9] states that up to 1927, of 110 cases examined 21·8 per cent. were of bovine type. Combining two later series, one in which the cerebro-spinal fluid was cultured and one where post-mortem cultures were made, he found that 11 out of 14 adults showed human infection, and 95 of 126 children under 15 were infected with the human bacillus.

The mortality in the present series, and in Murray's 24 cases, was 100 per cent. Yet a study of published cases leaves no possible doubt that recovery may take place. Cramer and Bickel [10] review 46 cases of proved tuberculous meningitis from which the patients recovered; the bacilli were demonstrated either in the cerebro-spinal fluid or by animal inoculation, in some instances by both methods. Of these 46 patients, 30 per cent. were aged 20 years or more. They estimate that perhaps 25 per cent. died later of tuberculosis. Kramer and Stein [11] record one case of recovery from tuberculous and syphilitic meningitis (though the evidence for tuberculosis was weakened by a negative inoculation test, and the fact that the cerebro-spinal fluid was only positive for bacilli once in many tests), and review 73 cases of accepted recovery from proved tuberculous meningitis. Of these, 33 per cent. were aged 20 years or more, many remained well for three years, but relapses, or serious physical and mental sequelæ, were not uncommon.

One case (No. 7) in this series had a history of meningitis four years previously; no trace of this could be found at the post-mortem examination. Barber [12] records a case of recovery in a woman aged 37, who underwent operation twelve years previously for a tuberculous kidney; he remarks very significantly: "Had one supposed that the patient could get well, fuller clinical and pathological investigations would have been undertaken."

Pitfield's [13] case was a man of 50, who for ten years had suffered from pulmonary tuberculosis; he left hospital at his own request after three weeks, and was well two years later. Walker and O'Meara [14] describe the case of an army recruit who was admitted to hospital eleven days after being passed as medically fit; he presented signs of meningitis, and as there were sporadic cases of meningococcal infection at the time, he was given antimeningococcic serum intrathecally; the cerebro-spinal fluid contained 175 cells per c.mm., 95 per cent. being lymphocytes, and tubercle bacilli were found in the fluid. He was convalescent eight days after his admission. The father stated subsequently that for two months before enlisting his son had been irritable and had changed in his manner. The only method of treatment common to many of these cases of recovery has been frequent lumbar puncture.

SUMMARY

1. Twenty-nine cases of proved tuberculous meningitis in patients over 15 years of age are reviewed.

2. The sexes were equally represented; the average age was 26; the average duration of illness was fourteen and a half days; there was no instance of recovery.

3. All the classical signs and symptoms show great variation in prevalence, in intensity, and in the time of their appearance; many may be absent throughout the illness.

4. A clinical diagnosis of meningitis is rarely possible before the tenth day; an ætiological diagnosis is only possible by the finding of tubercle bacilli in the cerebro-spinal fluid, although tuberculosis is suggested by coagulum, lymphocytosis, increase of protein, and decrease of chlorides. The most useful clinical signs are those relative to the neck, the eyes, and the pyramidal track.

5. Recovery from tuberculous meningitis may occur, though this is very rare, and is often marked by serious sequelæ; the only certain help towards recovery is frequent lumbar puncture.

Twenty-four of the cases were seen in Withington Hospital; my thanks are due to the assistant medical officers for help with clinical notes, and to Dr. G. D. Dawson, pathologist to the hospital, for all the reports on the cerebro-spinal fluids.

REFERENCES

1. Warrington, W. B.: THE LANCET, 1910, ii., 1754.
2. Murray, D. S.: Ibid., 1930, i., 76.
3. Schultze, F.: Münch. med. Woch., 1926, lxxiii., 2009.
4. Paterson, D.: Practitioner, 1923, cx., 431.
5. Osler, W., and McCrae, T.: Modern Medicine, London, 1925, vol. i., p. 401.
6. Stewart, D.: Edin. Med. Jour., 1928, xxxv., 141.
7. Rich, A. R., and McCordock, H. A.: Bull. Johns Hopkins Hosp., 1929, xliv., 273, 371.
8. Association for Research in Nervous and Mental Disease, 1924, iv., The Human Cerebro-spinal Fluid, Paul B. Hoeber, N.Y., 1926.

(*References continued at foot of next page*)

CANCER OF THE LARYNX

THE ANCHORAGE OF RADIUM IN ITS TREATMENT

By N. Asherson, M.B.Lond., F.R.C.S.Eng.

ASSISTANT SURGEON TO THE CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL; SURGEON FOR DISEASES OF THE EAR, NOSE AND THROAT TO THE QUEEN'S HOSPITAL FOR CHILDREN

For the insertion of radium needles in external operations for cancer of the larynx or pharynx the hyoid cartilage, thyrohyoid membrane, and thyroid cartilage are exposed. The necessary amount of cartilage is resected to expose the deep surface of the growth. A bed is thus formed for the reposition of the palisade of radium needles, each of which has a thread attached, and a radium content of 1 mg. per cm. of active length. The practical problem of retaining the needles in position and formation, for the prolonged period of radiation, is encountered at this stage.

The pharynx and larynx, with the cervical structures, are in a state of incessant motion, and cannot be put at absolute rest. Their movements tend to dislodge and scatter the needles all over the operative field. A radiogram taken some days after insertion of the radium will prove this point. Failure of the growth to react to radium, as well as some skin burns, may be due to this slipping of the radium without the attendant being aware of the fact.

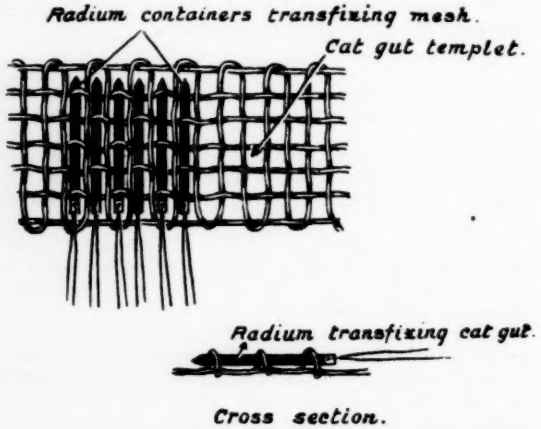


FIG. 1.—Catgut templet, loaded with threaded radium needles.

The devices in common usage for retaining the radium needles in situ include the following:—

1. Transfixion of the tissues adjacent to the growth with the radium needles. This carries with it the danger of penetration into the larynx or pharynx. The torpedo end is blunt, and does not aid the task of insertion.

2. Excising a window of cartilage corresponding exactly to the length of radium containers available, and retaining the latter in situ by tucking the ends between the inner surface of the cartilage and the deep surface of the growth. This is equivalent to making the exposure by fenestration according to the length of the needles available and not according to the size of the growth.

3. The radium needles may be sutured singly in situ with catgut. This is a prolonged and tedious process, and difficulties arise when the radium has to be withdrawn.

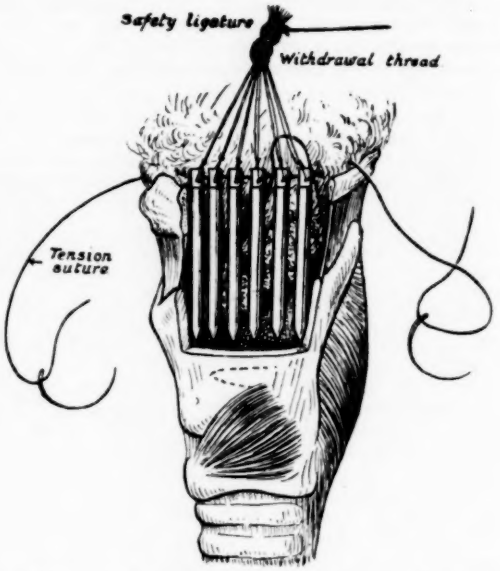


FIG. 2.—Cancer of epiglottis. To show anchorage of radium needles by the silkworm-gut stay suture.

To overcome the difficulty of fixation of the needles, I have found the following two devices of value: (1) anchorage by means of a catgut templet; (2) anchorage by means of a silkworm-gut tension suture.

ANCHORAGE BY MEANS OF A CATGUT TEMPLET

A loosely woven mesh of seven-day absorbable catgut was devised. The radium needles transfixed it, in a close palisade, in the way that pins are stacked in rows on paper. The ideal material for this purpose would be a strip of seven-day absorbable catgut, about an inch wide, with a double row of perforations to receive and lodge the radium needles. Such a strip is unobtainable, but at my request the Medical Supply Association, of Gray's Inn-road, wove a strip of catgut cloth, of coarse mesh, constructed with seven-day absorbable sterilised catgut. This strip is used as follows.

Before operation the sterilised threaded radium needles are fixed to the strip by transfixion (Fig. 1). The needles are stacked close together, in parallel palisade formation. When the bed for the radium needles has been exposed by resection of part of the hyoid and thyroid cartilages—e.g., for carcinoma of the epiglottis—a loaded strip is cut and trimmed corresponding to the size of the bed.

This catgut templet, usually containing six to eight threaded needles, is lowered into position, and the skin sutured over it. This keeps the radium in position. There is no difficulty in recovering the radium at the end of seven days, as the catgut mesh has disintegrated by then.

The mesh of the strip must be as fine as possible. The radium needles may be tied to the net with seven-day catgut, instead of attached by transfixion.

DR. HOLMES: *References*

(Continued from previous page)

9. Griffith, A. S.: Jour. Path. and Bact., 1932, xxxv., 97.
10. Cramer, A., and Bickel, G.: Ann. de Méd., 1922, xii., 226.
11. Kramer, D. W., and Stein, B. B.: Arch. Int. Med., 1931, xlviii., 576.
12. Barber, H.: Brit. Med. Jour., 1920, i., 601.
13. Pitfield, R. L.: Amer. Jour. Med. Sci., 1913, cxlvi., 37.
14. Walker, W., and O'Meara, F. J.: Jour. R.A.M.C., 1932, lviii., 50.

ANCHORAGE BY MEANS OF A SILKWORM-GUT TENSION SUTURE

The problem of preventing the displacement is solved if the needles can be retained indefinitely in situ by being strung upon and suspended from a fixed non-absorbable suture, after the fashion of clothes hung on a line. To achieve this purpose, a strong silkworm-gut is passed through the eyes of the threaded radium needles, which are drawn together snugly and parallel with one another. To each free end of the silkworm-gut is threaded a curved, cutting-edge needle. The serried palisade of radium needles is placed in the operative bed formed for it, in the depth of the wound, after resection of the cartilage. It is retained in position as follows.

The adjacent attached needle transfixes the tissues, from within outwards, at the upper, anterior, deepest part of the radium bed, taking up sufficient tissue to ensure a firm anchorage (Fig. 2). Care must be taken not to pierce any veins or blood-vessels, otherwise a troublesome hæmorrhage is precipitated.

The needle further transfixes all the tissues, emerging through the skin at some distance from the margin

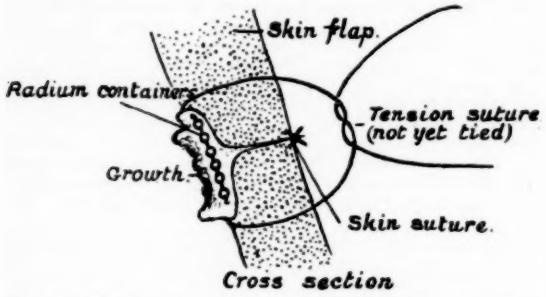


FIG. 3.—Cross-section of wound (diagrammatic) to show suspension and position of the needles.

of the incision. An artery forceps is attached to the free end after detaching the needle. The other end of the silkworm-gut is similarly drawn through the upper posterior and deepest part of the radium bed, and then through the skin. An artery forceps is attached to it. The first point of entry of the needle on each side is such that traction simultaneously exerted on both ends of the silkworm-gut will draw the embedded silkworm-gut line taut, and so draw the radium needles into position firmly, accurately, and closely together, retaining them in situ. After the skin incision has been sutured subsequently, the free ends of the silkworm-gut are tied together firmly over it. It forms a tension suture and may be tied over a small pad of gauze to act as a dressing stay suture, obviating the use of a pressure bandage (Fig. 3).

When the time arrives for withdrawal of the radium, the silkworm suture must be severed on each side close to the point of emergence through the skin, which has been previously rendered sterile. This will prevent unnecessary infection entering the wound on withdrawal of the radium.

In a recent case of inoperable extrinsic carcinoma of the larynx, this method of anchorage was used with success. A radiogram taken on the seventh day after insertion revealed the radium needles in the same position as when first inserted, though the patient had been permitted absolute freedom of movement and was subject to bouts of coughing.

It has been my custom, when embedding radium, to twist all the attached double threads into one cable. This is knotted about three inches from the needles, and the redundant ends are cut short. The cable is coiled up in the depth of the wound at its lower part. The wound is then completely sutured. When the wound is reopened subsequently, after the skin stitches are removed, the edges are gently prised apart with dressing forceps and the cable is easily picked up. Even if only a single thread is located, traction on it will withdraw the entire bundle.

Extraction of the needles may be facilitated by previously tying a single withdrawal thread around the cable (Fig. 2) and allowing it to come through the lower end of the incision. Traction on this will deliver the cable and the needles.

The method of fixation of the radium needles by the stay non-absorbable suture is the method of choice, as it is rapidly performed and there is no occasion to excise a cartilage fenestra to fit the exact length of the radium needles available.

A CASE DEMONSTRATING THE VALUE OF GORDON'S TEST IN HODGKIN'S DISEASE

BY ROBERTSON F. OGILVIE, M.D., M.R.C.P. EDIN.

ASSISTANT IN THE PATHOLOGY DEPARTMENT OF THE UNIVERSITY OF EDINBURGH; ASSISTANT PATHOLOGIST, ROYAL INFIRMARY, EDINBURGH; AND

C. E. VAN ROOYEN, M.B. EDIN.

ASSISTANT IN THE BACTERIOLOGY DEPARTMENT OF THE UNIVERSITY

RENEWED interest has been aroused in Hodgkin's disease by Gordon's description [1 2] of a biological test which may be carried out with lymphadenomatous tissue obtained at either biopsy or autopsy. The value of this test is demonstrated by the following case in which the findings, even post mortem, still left the diagnosis in doubt.

CLINICAL HISTORY

A married woman, aged 24, with one child, took a "cold" in November, 1931, and developed a troublesome dry cough which was accompanied by pain over the sternum. Thereafter she noticed that she was losing weight, and complained of increasing weakness. Early in 1932 a swelling appeared in the right supraclavicular region. As she could not get rid of the cough she went to her doctor in February. He referred her to the Royal Infirmary, Edinburgh, for X ray examination, and in consequence of the findings at this examination she was admitted to the Infirmary on May 4th.

She had had several attacks of pain in the right iliac fossa during the past three years. In the family history there was nothing of interest.

Examination.—She was of medium stature, sparely nourished, and looking on the whole fairly healthy. Her temperature was 98° F.; her pulse-rate 74; and her respiration-rate 20. She had a cough, but no sputum or breathlessness; she had had some pain behind the sternum. The thorax was well formed; there was slight fullness on the right side at the root of the neck. In the posterior triangle on the right side some discrete, hard lumps about the size of walnuts were felt. They appeared to be continuous with a mass which disappeared behind the sternum. There were no more lumps on the left side. There was greater dullness than normal over the sternum, and this dullness was also present for 2 in. on each side of the median line in the first, second, and third interspaces. Over the rest of the chest the note was normal. Vesicular breathing was heard all over both lungs, and vocal resonance was not increased. Nothing unusual was noted in the circulatory system, except abnormal faintness of heart sounds in the aortic and pulmonary

areas. The lymph glands were enlarged in the right posterior triangle of the neck, but not elsewhere. The alimentary, genito-urinary, and hæmopoietic systems showed nothing of note. The urine was normal, and the Wassermann reaction of the blood negative. Radioscopy showed in the upper anterior mediastinum a large shadow of even density and irregular outline. The trachea was centrally situated and not compressed.

Clinical Diagnosis and Treatment.—In view of the clinical and radiological evidence a diagnosis of sarcoma of the thymus gland was made, and a course of deep X ray therapy instituted. In consequence of this treatment the neoplastic mass underwent a rapid and pronounced diminution in size. The patient was discharged on May 21st and given instructions to attend the radiological department as an out-patient. Her general condition was then good.

State on Readmission.—She was readmitted on Feb. 22nd, 1933, with a history of increasing malaise, weakness, and dyspnœa, giddy turns, cough with little sputum, and loss of weight. Dullness was present below the clavicle to the second rib, and tranversely from an inch to the right of the midline to 3 in. to the left. Posteriorly there was a midline area of dullness about 4–5 in. broad. Over these regions vocal resonance and fremitus were greatly increased, and breathing was bronchial in type with no accompaniments. The supraclavicular glands were palpable on both sides, round and shotty, largest on the left. Post-cervical glands were also palpable. One gland in each axilla was enlarged to the size of a big walnut, but none were felt elsewhere. X ray examination now revealed definite enlargement of the mediastinal mass, together with diffuse opacity of the upper lobe of the left lung.

Termination of Illness.—While in hospital the patient developed a large bilateral pleural effusion. Repeated aspiration had no effect in reducing the amount of fluid, which showed numerous red blood corpuscles and lymphocytes with a fair number of endothelial cells and polymorphonuclears, but no organisms. She rapidly became weaker and more breathless, and died on June 3rd.

POST-MORTEM EXAMINATION AND DIAGNOSIS

Both pleural and the pericardial cavities contained large quantities of greenish serous fluid. In association with the parietal layer of the pericardial sac on the left side, there was, just above the diaphragm, a large mass of nodular, very firm, pale yellowish-white tissue. The peritoneum, larynx, and trachea were healthy.

The pleura of the left lung was smooth and glistening over the upper lobe, wrinkled over the lower lobe. The upper lobe was uncollapsed and more or less uniformly consolidated; the lower lobe was unduly collapsed. Section revealed that the consolidation of the upper lobe was due to extensive infiltration of the tissue by new growth, which seemed to have originated in the region of the hilum and spread peripherally. The margin of the infiltrated zone was irregular, but fairly well defined. The infiltrated area was greyish-yellow in colour, with here and there a congested hæmorrhagic patch. The surrounding lung was rusty-red in colour. The lower lobe was congested. The right pleura was unduly wrinkled, and the right lung collapsed, congested, and moderately œdematous.

A group of enlarged glands was present at the base of the neck on the left side. These glands were fairly discrete and very firm, and presented on section pale yellowish-white, more or less homogeneous surfaces; no necrosis or caseation was evident. A few enlarged glands were also present in the anterior mediastinum, and there was a chain along the vertebral column in the posterior mediastinum. Another large mass of glands was present along the lesser curvature of the stomach, and the para-aortic group of glands was markedly enlarged. The heart showed brown atrophy. The liver and spleen showed well-marked chronic venous congestion. The kidneys also showed chronic venous congestion.

The macroscopical findings necessitated a consideration of (1) Hodgkin's disease; (2) carcinoma of lung (bronchial or alveolar); and (3) mediastinal sarcoma. Points in favour of Hodgkin's disease were the age of the patient, the excellent response to irradiation, the widespread lymphatic involvement and the character of the glandular masses (discrete, non-necrotic, non-caseous). Points against this diagnosis were the invasion of the left lung, the presence of a large mass in association with the pericardial sac, and the absence of splenic and hepatic involvement. Bronchial carcinoma was favoured by the character of the growth invading the upper lobe of the left lung. The situation of this apparent neoplasm also suggested the possibility of a sarcoma of mediastinal origin.

BIOLOGICAL TEST

Although the weight of the evidence was in favour of Hodgkin's disease, it was impossible to be certain of this diagnosis without microscopical examination of the tissues. While ordinary paraffin sections were being prepared it was decided to employ and test the efficacy of the recently described Gordon biological test for Hodgkin's disease.

In order to avoid superficial contamination, enlarged lymphatic glands removed from both neck and abdomen were flamed in absolute alcohol and plunged into boiling water for two seconds. The superficial loose tissues were then clipped away, and the central portion prepared for emulsification. About 2 g. of tissue were then ground in 20 c.cm. of broth (pH 7·1) and a part of it used for the immediate inoculation of rabbits, whilst the remainder was stored at −4° C. in the refrigerator for later use.

Three rabbits were prepared for intracerebral inoculation, and approximately 0·35 c.cm. of the suspension was introduced into the occipital lobe of each animal to a depth of 3 mm., accompanied also by the administration of an intravenous dose of 0·5 c.cm. into the auricular marginal vein, conducted after the manner described by van Rooyen.[3]

The animals withstood the operation satisfactorily and were apparently in good health after 36 hours. At the end of 48 hours, however, all three rabbits showed slight signs of impaired locomotion. This was followed next day by spastic paralysis of the hind limbs and marked ataxia with incoördination on attempted movement. The last-named features were more readily demonstrable by the application of Gordon's Romberg test for rabbits.[1]

Tissue suspensions which had been allowed to stand at −4° C. in the refrigerator for varying periods of time up to three weeks were used for the inoculation of 12 additional rabbits. Eleven of these developed the characteristic syndrome described by Gordon[1] within three days. Four rabbits succumbed to the illness, three recovered completely, and four passed into a chronic condition characterised by muscular atrophy of the hind-quarters, loss of weight and hair, and incontinence of urine and fæces.

Bacteriological examination by aerobic and anaerobic methods of cultivation failed to reveal the presence of any organism in the brains of animals which had died from the condition. Media were kept under observation and remained sterile for four weeks.

The above results favoured the conclusion that the case from which the glands had been taken was one of Hodgkin's disease.

Microscopical examination of tissue from cervical and para-aortic lymph glands, pulmonary growth, and pericardial mass was carried out a week after the autopsy. The histological appearances were in all cases similar. The tissue consisted in the main of a mass of reticulo-endothelial cells of all sizes up to small giant-cells of the typical Hodgkin type. Among this heterogeneous mass of cells were scattered numerous lymphocytes. The background consisted of finely granular, eosinophilic, necrotic-looking material. Here and there fairly large areas of tissue had undergone complete necrosis. This was especially so in the case of the pulmonary growth. Occasionally evidence of slight fibrosis was apparent, but this was not at all an outstanding feature. The condition

was histologically one of acute "malignant" Hodgkin's disease.

SUMMARY

The Gordon biological test was applied to a case in which the clinical and post-mortem naked-eye findings were not conclusive of Hodgkin's disease. The test gave a positive result in 48 hours and thus substantiated a diagnosis of lymphadenoma. This was corroborated a week later by microscopical examination of the tissues.

REFERENCES

1. Gordon, M. H.: Rose Research on Lymphadenoma, London' 1932.
2. Same author: Brit. Med. Jour., 1933, 1., 641.
3. van Rooyen, C. E.: Ibid., p. 644.

THE TREATMENT OF CANCER WITH CONNECTIVE TISSUE EXTRACTS

By H. Searle Baker, M.R.C.S. Eng.

This paper describes a method of treatment which has given encouraging results in a few cases of inoperable cancer.

In 1928 I formulated a theory which I have since elaborated and for which support has been found in the recorded observations, both in fact and theory, of other workers. I am of opinion that the excessive growth of cells is controlled by substances secreted in the connective tissue of their area. It is not an unreasonable postulate that a factor exists to inhibit the tendency of living cells to reproduce themselves indefinitely, and my work is based on the view that this factor is a substance secreted locally outside the blood stream and discharged into the lymph. If a cell, or group of cells, be deprived of adequate inhibition—e.g., by lymph stasis or actual failure of secretion—it will reassert its fundamental tendency towards unlimited growth.

Further to, but not essential to, this hypothesis are the following views. It is not impossible that the inhibitory factor be an enzyme, and for various reasons it is considered that its major function is lipolytic. It is secreted in the connective tissues and functions to the best advantage in the area of its secretion. In normal healthy persons it is destroyed in the lymphatic glands, and eventually, if it escapes this, in the blood stream.

Treatment is designed to introduce this essential substance into the carcinoma by the intravenous administration of an extract of connective tissue derived from an area, in the pig or cow, corresponding to that of the primary growth in the patient. In my experience the result of this treatment has been that the patient loses his cachetic appearance and the carcinoma diminishes in size and becomes attenuated in vigour. This suggests that by repeated courses of treatment at lengthening intervals the carcinoma may be deprived of its power to destroy life. Assuming that the inhibitory factor has been introduced in the blood stream in sufficient quantity and is circulating, it is manifest that it will attack the overgrowth of cells, at any rate cells from its own area, wherever it may meet them. That is to say, its action can be expected to, and in fact does, apply to metastases as well as to the primary growth.

The following is a chronological account of my endeavours to apply my theory to treatment. Cases 1 and 2 were undertaken before the theory which has been outlined was fully matured.

CASES TREATED

Case 1—(1929).—Female, aged 64. Treated in Royal Northern Hospital by courtesy of Dr. C. C. Beatty. Laparotomy had been performed at Middlesex Hospital, and a diagnosis of inoperable carcinoma of the ovary had been made. There was considerable ascites and the abdominal wound was well healed. Paracentesis abdominis was performed daily under local anæsthesia, and the fluid obtained was reinjected intravenously in doses increasing up to 30 c.cm., in an attempt to ascertain whether or no it contained any factor inhibiting the ovarian growth. The patient put on 14 lb. in one month, but the growth of the carcinoma appeared to be accelerated. It was considered probable that the ascitic fluid had a high content of anti-inhibitory substances.

Case 2—(1930).—Male, aged 56, with a large, ulcerating, superficial carcinoma of the chest wall. A solution of muscle extract was given intravenously, and with doses of 15 c.cm. daily it was found that the growth could be controlled. The ulcerating edge ceased to show the characteristics of malignancy and the growth ceased to extend. But the malignant appearance reasserted itself when treatment was withdrawn for a period so short as two days, so that no permanent benefit could be expected. The phenomena noted were regarded as being due to an endosmosis from the tissue fluids into the blood stream and into the growth. Treatment was stopped so soon as the very temporary nature of benefit was established.

Case 3—(1931).—Female, aged 56. The left breast had been removed in 1930 for carcinoma, and there was now recurrence in the left axilla with carcinomatous nodules in the skin; clinically there were also deposits in the lungs and liver. A solution was made of an extract of connective tissue from the breast of a sow. This solution was in normal saline and unbuffered. A preliminary intravenous injection was made of 1 c.cm., and subsequent doses were increased in order to overcome the postulated capacity of the blood to resist the inhibitory factor. The superficial deposits blanched on treatment; their surface umbilicated and their area diminished. They were ringed round at the beginning of treatment so that shrinkage could be confirmed. The lungs exhibited the clinical phases of regressing pneumonia and the liver became impalpable. She had numerous lipomata on her arms and these vanished. Pain, a prominent symptom, was relieved. Eight weeks after the first course of treatment the superficial deposits showed renewed activity. A further supply of the extract was obtained and treatment was renewed. Once more the superficial deposits blanched and shrank, and the patient had pulmonary symptoms. She then appeared to be free from active carcinoma until her death four months later—nor did her death appear to be due to an extension of the carcinoma. The activity of the extract appeared to be beyond question, but its "keeping" power was very small.

Case 4—(1931).—Male, aged 64. Carcinoma of the floor of the mouth with secondary deposits in the cervical glands. A local excision with diathermy had been performed and radium had been used without success. An extract was made from the connective tissue of the floor of hogs' mouths, prepared as in Case 3. This was injected intravenously in doses up to 15 c.cm. The primary growth became smaller and its surface cleaned. A central papillomatous outgrowth detached itself and fell out. The fœtor of the breath vanished and the cervical glands became more mobile. The very considerable pain was relieved, and the disease became inactive. When the growth became active again a further supply of extract was obtained but this precipitated within 24 hours. The supernatant fluid was injected but there was a considerable constitutional reaction, and the patient refused further treatment. He quietly went downhill and died of his carcinoma.

Case 5—(1931).—Female, aged 66. This case, by the kindness of Mr. Arthur Evans, was treated in Westminster Hospital. There were numerous carcinomatous nodules in the skin, recurrent after amputation of breast. An extract was obtained of connective tissue of sow's breast. This, on the advice of Sir F. G. Hopkins, was buffered

with sodium phosphate and its keeping quality was thereby improved. The solution was injected intravenously each day, doses increasing from 1 to 20 c.cm. Almost exactly one hour after injection the patient had a rigor, but half an hour after that she was quite fit again and ate her midday meal with appetite. A nodule was excised before treatment and another after a course of treatment lasting a fortnight. Microscopical sections showed a very marked diminution in carcinoma qua carcinoma with considerable fibrosis.

(1932.)—About four months after her last course of treatment the carcinoma was again active. Criticism had been offered that the sections from the first course of treatment had been taken from separate nodules. The patient was readmitted to Westminster Hospital and a further supply of extract of connective tissue of sow's breast was obtained. This time the pressure employed at filtration was removed and the extract was stored in nitrogen. Half a nodule was excised before treatment and the remainder after treatment. The wounds healed by first intention. Sections showed the diminution in carcinoma previously noted, without the fibrosis. It may be that this was due to the alteration in filtration pressure in preparation of the extract.

In 1932 some published observations of the late Dr. J. D. Shaw Mackenzie led me to seek an interview with him. I found that, although there were differences in our point of view, he was satisfied by experiment that he had prepared a lipase from connective tissue. Accepting his statement on this point it was decided that future treatment would be conducted with a solution ultimately containing 10 per cent. of glycerin, and that the pH of the extract should be adjusted to 7·5 and carefully maintained there at every stage of preparation of the extract.

In June the public health committee of a county council, through the good offices of the medical officer of health, accorded me permission to pursue my work at a public assistance hospital, subject to supervision by the medical superintendent and the consulting physician to the hospital. Cases 6 to 11 were treated at this hospital and it was stipulated that Cases 6 to 9 should be on a pure protein diet.

CASE 6—(1932).—Male, aged 58. Inoperable carcinoma of larynx. An extract was prepared from the connective tissue of larynx from several hogs. A total of 50 c.cm. was injected in eight doses, intravenously, in eight days. The patient was very definite about the relief of his symptoms, saying: "I can go to bed now and not be afraid of stifling in the night." No more laryngeal extract was available. During the six weeks after treatment the effect wore off and intravenous injections were resumed—but this time of connective tissue from sow's breast. This produced no benefit. Later, as a placebo, intramuscular injections were given of extract of uterine connective tissue. This was without apparent benefit, apart from its action as a placebo.

CASE 7—(1932).—Male, aged 62. Inoperable carcinoma of tonsils and pharynx. An extract was prepared of hog's tonsillar and pharyngeal connective tissue. Fifty cubic centimetres were injected as in Case 6. The pharynx and tonsils had been covered with a carcinomatous ulcer, foul and sloughing. During treatment this condition cleared up in a very satisfactory manner—its area diminished and the edges of the ulcer lost their malignant appearance. Unfortunately no more pharyngeal extract was available.

For Cases 8 and 9 ten variations were made in the method of preparation of the extract.

CASE 8—(1932).—Female, aged 51. Inoperable carcinoma of right breast, with a large area of ulceration in right axilla, very marked œdema of right arm and hand. Extract No. 5 was first employed and 50 c.cm. was given intravenously. This extract was a variant from the earlier preparations in that it contained 0·1 per cent. sodium taurocholate and 0·1 per cent. sodium glycocholate, with a view to preventing a theoretical absorption of enzyme to the surface of the preparation. Its basis was connective tissues of sow's breast. A note was made that No. 5 extract was clinically more active than No. 1 (see Case 9). When one bottle (50 c.cm.) had been used, treatment was continued with No. 10. Up to that point the improvement in the patient had been marked. The ulcerated area looked much better and was about half covered with epithelium. There was also marked improvement in the patient's sense of well-being—possibly psychological. Now for various reasons No. 10 was made from sow's breast, less connective tissue and without bile salts. The patient was tolerating high doses and 20 c.cm. was given of this preparation. Within four days it was clinically manifest that this preparation was definitely anti-inhibitory. The improved general condition relapsed and there were retrograde signs in the ulcerated area. It was decided to scrap No. 10 and continue treatment with No. 2. The variant of this preparation was that the connective tissue was subjected to the action of pure glycerin whilst the tissue was being ground with fine sand. This appeared to control the growth but it did not produce improvement. No. 4 was subsequently employed—this was an extract of whole sow breast. This appeared to exercise some degree of control and was followed by No. 6, which was No. 4 plus bile salts 0·2 per cent. But no preparation produced a marked effect subsequent to the injection of No. 10.

No more No. 5 was available or it would have been used again. There was no question as to its efficiency.

CASE 9—(1932).—Female, aged 66. Inoperable carcinoma of right breast. Secondary deposits in humerus and ulna, and in liver also. An ulcerating area of growth in axilla approximately 8″ by 4½″. Massive œdema of right arm and hand. In this case treatment was begun with solution No. 1 of connective tissue extract of sow's breast. This was a solution containing 10 per cent. glycerin, 0·5 per cent. sodium phosphate, and 0·5 per cent. phenol. The first injection was given on June 8th and the last dose of this preparation on the 14th. During this time a slow but steady improvement in the case of ulceration—it diminished in size and showed approximately half the area covered by epithelium. But the general condition was very grave, and on June 16th a note was made that the patient appeared moribund. If she had died it is by no means certain that the end would have been accelerated by treatment. Despite her condition treatment was pursued, but the extract used was No. 6. This was No. 4 solution (vide Case 8) plus 0·2 per cent. bile salts. From June 16th she began a steady improvement. Intramuscular injection was performed on two consecutive occasions but it did not produce the clinical improvement that was shown on intravenous injection. On August 26th she was still improving with extract No. 6, so it was decided to try the effect of substituting cow for sow as the source of the connective tissue. It was not clear that this improved the function of the extract. Treatment was continued up to December, 1932, with extract No. 5, when unfortunately it had to be abandoned. The ulcerated area of growth which in June had extended over 36 sq. inches then occupied about 3 sq. inches, which was firmly healed except for two small areas of about the total size of a sixpenny piece. The liver was impalpable. The œdema of the arm was slowly diminishing, and the severe pain of which she had complained was very much better. It was considered that the optimum effect was secured by extract No. 5. When last seen in June, 1933, this patient was fairly well. The ulcerated area still occupied 3 sq. inches, but its surface was very foul and discharging. There was a considerable new deposit of carcinoma around the ulceration and in the skin. It was considered that, although no further course of treatment has been possible, her life was prolonged in relative comfort for at least one year. I am informed that she is still alive.

CASE 10—(1932).—Female, aged 46. Inoperable carcinoma of ovary. Diagnosis made after laparotomy. An extract of Fallopian and ovarian connective tissue was prepared as No. 5 (see Case 8). The extract was employed by the intravenous route, and after 84 c.cm. had been given in three weeks it was judged that the patient was fit to return home. The uterus was then definitely more mobile than on admission and a tumour in the pouch of Douglas was considerably diminished in size. But on the morning when she was about to be discharged she

had a sudden and severe collapse and drop in her blood pressure, accompanied by vomiting. This was approximately 20 hours after her last injection. She responded to adrenaline but had a parallel attack in about two hours. This was controlled by adrenaline, but a further attack, 36 hours after her last treatment, proved fatal before adrenaline could be used. This interval of 36 hours considerably obscured the immediate cause of death.

CASE 11—(1932).—Female, aged 59. Carcinoma uteri recurrent after hysterectomy. An extract was made of connective tissue from sow's uterus plus 0·2 per cent. bile salts. Only 50 c.cm. was available. This was duly injected intravenously, and the patient's only symptom, a profuse vaginal discharge, cleared up completely.

CASE 12—(1932).—Male, aged 56. Treated by Dr. T. Owen of Grange Park. A melanotic carcinoma primary in the eye, which had been excised, with large metastasis in the liver, which had been rapidly enlarging. An extract was made in this case from pig's retina and duly injected. It was reported that the metastasis had ceased to enlarge and was perhaps even contracting, but after the patient had received 100 c.cm. he was unable to afford further treatment.

CASE 13—(1932).—Male, aged 74. Treated by Dr. J. D. Whiteford of Walthamstow. An extract was made of connective tissue of pig's tongue and employed by the intramuscular route. It was reported that the ulcerating surface of the growth was speedily cleaned and the tongue became more mobile; but the patient, for no other reason than that he was obstreperous, refused to prosecute treatment.

These cases suggest that here is a treatment that will prove of definite value in carcinoma. There was no lack of response in any case to which it was applied, and one patient (Case 9) has survived in relative comfort for a year beyond her expectation. Moreover this was the only case in which there was adequate treatment up to a point.

SOURCE AND USE OF THE EXTRACTS

Preparation.—The extracts were prepared by Messrs. Research Products, Ltd., of Henrietta-street, London, W.C.2. Instructions were that the material used was to be removed immediately on the death of the animal and prepared straightway. It was not to be heated, kept on ice, or abnormally chilled, nor was it to be unduly shaken nor subject to any form of digestion. Its pH was to be kept constantly at 7·5 throughout preparation. The following is a description of the method employed in making extract No. 5 (breast):—

33 g. of connective tissue was obtained from 123 g. of sow breast. This was thoroughly ground, in 10 c.cm. of glycerin, with fine sand. 90 c.cm. of water was added and the whole was filtered at the maximum pressure consistent with effective sterilisation, through a Seitz filter. 0·5 per cent. phenol was added and the reaction adjusted. 0·5 per cent. sodium phosphate was added and the pH checked. 0·1 per cent. sodium taurocholate and 0·1 per cent. sodium glycocholate were added—the pH again adjusted, and the extract was boiled in nitrogen.

Activity of the extract as thus prepared is only retained for 10–14 days, when precipitation may occur.

Dosage.—The preliminary dose was in every case 1 c.cm. Subsequent doses were increased gradually with a view to overcoming a postulated increasing resistance of the blood to inhibition. The maximum dose employed was 25 c.cm. I think that the method of choice is without doubt the intravenous route, and the interval between doses to secure a proper clinical effect should not exceed four days.

Reaction.—The immediate result of injection is flushing of the skin in the neighbourhood of the needle. This is followed by flushing of the face, suffusion of the conjunctivæ, and discomfort—sometimes amounting to pain—in the tongue, within about 30 seconds. If large doses be given these symptoms are followed by a throbbing headache which may last for half an hour. Rigors occurred in one case. It is not considered that the death reported in Case 10 was directly related to treatment. No other unpleasant effects have been noted except in Case 3, where there was febrile disturbance accompanied by pulmonary symptoms—held to be due to the existence of metastases in the lung. Prolonged treatment may cause depression, but this is counterbalanced by the psychological value of the fact that some treatment is being undertaken and some result is achieved.

This brief paper is an account of the work I have done and the observations I have made. The reason for its publication is that I consider the results definitely promising, but I have no means and no prospect of prosecuting the research, and I am hoping that some other worker may be stimulated to follow up this line of inquiry.

AN ANAEROBIC GRAM-NEGATIVE BACILLUS AS A CAUSE OF PYÆMIA

BY A. W. FRANKLIN, M.B. CAMB., M.R.C.P. LOND.

CHIEF ASSISTANT, DEPARTMENT FOR THE DISEASES OF CHILDREN, ST. BARTHOLOMEW'S HOSPITAL

DURING the year 1932 an unusual gram-negative anaerobic bacillus was isolated in pure culture from the blood of two fatal cases of pyæmia. The cases presented many features in common: both were young girls with acute suppurative otitis media, in whom the infection seemed unusually severe in its effects on the general condition and on the temporal bone. Pus from the ears and the metastatic abscesses of both shared with cultures of the bacillus a characteristic fœtid odour. As a result of a study in the literature of the records of a few similar cases and of apparently related bacteria, the organism is regarded as a member of the group of anaerobic or microaerophilic bacilli of which *Fusiformis fusiformis* (*B. fusiformis*) is the type.

Though there are earlier descriptions of fusiform bacilli, notably that by Plaut[1] in 1894, Vincent (1896)[2] was the first to study *B. fusiformis*, which he found in the pus and in the tissues of cases of hospital gangrene. All his efforts to cultivate the organism failed, but he did produce a fœtid abscess containing the bacillus by inoculating pus, first in combination with a streptococcus into a healthy rabbit, and secondly alone into a rabbit in the late stage of tuberculous cachexia.

Veillon and Zuber (1898)[3] reported the first successful cultivation. Noting the disparity between the gram film of pus from fœtid abscesses and gangrenous tissues with its "purée microbienne," and the relative sterility of aerobic cultures, they determined to study such pus by making shake cultures and growing colonies in the depths of glucose agar tubes. Six different types of organism were isolated, including *B. fusiformis*, and the *B. ramosus* and *M. fœtidus* referred to below; later work has added to the number.

Veillon writing in 1920 of infections associated with gangrene claimed that true gangrene, a combination of inflammation, tissue death, and putrefaction, can only be caused by anaerobic organisms. Of these he recognised two groups. The first, now known as

the fusiformis group, is delicate and non-sporing. Although the morphological characters, colonial appearances, and gram reactions vary, the members resemble each other in the fœtid odour of their cultures, their pleomorphism, their distaste for oxygen, and the difficulty with which they are grown. In spite of travelling in the blood stream to form metastatic abscesses, they rarely cause septicæmia, and are found in such conditions as noma, the anginas, fœtid otorrhœa, bronchiectasis, pulmonary abscess and gangrene, fœtid empyema, and gangrenous appendicitis. More than one type is usually grown from each case, in company with aerobic cocci and coliform bacilli.

The second and better known group contains the coarser, spore-forming, soil organisms, of which *B. welchii* is the type.

THE FUSIFORMIS GROUP AS PATHOGENIC AGENTS

Only *F. fusiformis*, found most commonly in Vincent's angina, has been seriously studied. In the most recent paper Varney (1927),[4] who gives a good historical survey, describes a serological classification of 18 strains into four types. The finding of *F. fusiformis* as the predominant organism in fœtid abscesses and pus is recorded by Peters (1911),[5] Dick (1913),[6] Dick and Emge (1914),[7] and Pilot and Pearlman (1923).[8] It has been described in sputum and as pathogenic in lungs and bronchi by D. T. Smith (1932),[9] who gives a summary of the literature. In none of these reports was *F. fusiformis* described alone, nor is it clear what part it played, whether that of prime cause or of secondary invader.

Vaucher and Woringer (1925),[10] in an article on bacteræmia and septicæmia due to anaerobes, state that they were able to find only a few observations of the presence of members of this (fusiformis) group in the blood stream. In 1912 Rosenow and Tunnicliff [11] reported a case of "pyæmia due to an anaerobic polymorphic bacillus, probably *B. fusiformis*." Varney's observations [4] make it probable that in this case the cultures were not pure, and that there may have been present *F. fusiformis*, a spirochæte, and an organism closely resembling the one to be described below. Larson and Barron (1913) [12] claim to have isolated *B. fusiformis* from the blood stream, but their report is not accepted by Varney. Boez and Keller (1924) [13] described a case of septicæmia in a woman of 28 years, following uterine infection, and due to an anaerobe with the characters of *Micrococcus fœtidus* of Veillon. Boez and Holtzmann [14] reported the case of a woman of 33 years, who died after a vague illness, characterised by fever, rigors, progressive weakness, and anæmia. No autopsy was allowed. Blood culture in solid media, a method insisted on for this work by many workers, grew an organism with the characters of *B. ramosus* of Veillon. In 1925 two cases of tonsillar sepsis followed by pyæmia due to an anaerobic gram-negative bacillus were reported by Hegler and Jacobsthal.[15] The organism found was said to resemble bacteriologically the one described by Buday (1916) [16] as responsible for an epidemic of pyæmia with liver and lung abscesses in 24 cases of suppurating gunshot wounds in two wards of a Budapest hospital. In 1927 Conway Davies [17] described a case of pyæmia due to an unidentified anaerobic bacillus ending in recovery.

The exact relation of the organism isolated in the cases hitherto reported to the organism found in the cases described below is impossible to determine. In no case has a complete bacteriological study been possible. The undoubted similarity of clinical and bacteriological features in some of these cases and in the two fresh ones here reported makes it reasonable to class them together—at least until further information concerning the fusiformis group becomes available.

TWO NEW CASES

A young woman, aged 18 years, was admitted to St. Bartholomew's Hospital under the care of Mr. Sydney Scott on Feb. 29th, 1932, on account of a painful, discharging right ear. Three weeks before admission she had had an attack of tonsillitis, with fever, sore-throat, and swollen cervical glands; two weeks before admission she had pain in the right ear, followed by discharge.

Diagnosis on admission was acute suppurative otitis media, though the patient appeared unusually ill and "toxic." An immediate right Schwartze was performed by Mr. Scott; fœtid pus was found in the mastoid cells under pressure; the lateral sinus and the middle fossa dura were exposed and appeared normal.

Course.—The general condition improved only slightly after operation, pus continued to discharge from the wound, and the temperature rose occasionally to 100° F. For these reasons, and because the tonsils appeared septic, after much deliberation tonsillectomy was performed by Mr. F. C. W. Capps on March 17th. After operation the temperature began to swing, reaching 104° F. 31st: examination by Dr. A. E. Gow showed no abnormal signs in heart or lungs. April 4th: an abscess in the right parietal region was opened by Mr. Scott, who found that the whole right parietal bone was infected up to but not crossing the limiting sutures, suggesting a metastatic rather than a direct spread of the infection. The infected bone was removed, the lateral sinus explored and obliterated.

Twelve days later an abscess over the frontal bone extending back to the occipital region and an extradural abscess were evacuated, with further extensive bone removal. Some temporary improvement followed blood transfusion, but by April 26th the temperature rose again, and on the 30th, with the onset of rigors, oliguria, and hæmaturia, a clinical diagnosis of septicæmia was made. Antistreptococcal serum was given intravenously. On May 6th there were signs of fluid in the left pleural cavity; on the 7th a skin abscess appeared in the region of the olecranon, followed by one in the region of the acromion. The patient's condition continued to deteriorate. On the 17th there was sudden pain in the chest and collapse. A chest skiagram showed evidence of a cavity at the apex of the right lung, probably an intrapulmonary abscess, with an effusion at the left base. Death occurred on the following day. Post-mortem examination was not allowed.

Pathological investigations.—March 11th: red blood-cells, 3,440,000 per c.mm.; white blood-cells, 16,800 per c.mm.; Hb., 50 per cent. 31st–April 1st: blood culture sterile after eight days. 3rd: mastoid pus-gram film shows a gram-negative cocco-bacillus in long chains (see Figure). Cultures on blood legumen-agar and serum slope, sterile. Thought to be a dead streptococcus. 15th: blood culture sterile. 18th: red blood-cells, 2,790,000 per c.mm.; white blood-cells, 18,800 per c.mm.; Hb., 42 per cent. May 2nd: blood cultures positive in all tubes after 48 hours. 7th: urine smoky; albumin +, red blood-cells ++, white blood-cells +, blood and epithelial casts +. Aerobic cultures on blood legumen-agar and litmus lactose agar plates sterile. 9th: blood cultures positive in all tubes after 48 hours, growth of gram-negative cocco-bacilli.

Blood cultures were made by inoculating four peptone broth tubes with one drop, five drops, ½ c.cm. and 1 c.cm. of blood, and incubating the tubes aerobically at 37° C. Attempts to subculture this gram-negative cocco-bacillus on to blood legumen agar plates aerobically failed. Re-examination of the mastoid pus showed the presence of organisms with

the morphological characters of the gram-negative cocco-bacillus grown from the blood.

The second case was that of a schoolgirl, aged 5 years, admitted to St. Bartholomew's Hospital under the care of Mr. Sydney Scott on Oct. 11th, 1932, on account of a painful discharging right ear. Two weeks before admission she had had a cold in the head with right-sided earache; on this day a brother died at home after pneumonia. For four days the earache grew worse, and on day of admission there was headache, vomiting, and aural discharge. When admitted she was pale, ill, and delirious, with temperature 103·2° F., and pulse 140. There was slight stiffness of the neck; heart and lungs were natural. From the right ear came a copious, yellow, offensive discharge; the drum was perforated and the mastoid tender. The diagnosis on admission was acute suppurative otitis media.

Soon after admission a right Schwartze operation was performed by Mr. G. C. Knight, and generalised infection of lower and outer half of mastoid process was found. All the affected bone was removed and a drachm of fœtid pus evacuated from an extradural abscess around the lateral sinus. The sinus was not thrombosed.

Course.—Oct. 13th: patient fretful and delirious; copious offensive discharge from wound. Temperature 104° F. 14th: rigor, vomiting, photophobia. Signs of diffuse bronchitis. Albuminuria, hæmaturia. Lumbar puncture performed. Pressure of cerebro-spinal fluid, 240 mm. of water. Queckenstedt test showed lateral sinuses to be patent. X ray of chest shows clear lung fields. 7·5 c.cm. of antistreptococcal serum were given intravenously. The condition steadily deteriorated, temperature swinging from 99°–102° F., with a rising pulse-rate. 18th: respirations rose to 40 per minute. 20th: signs of consolidation of left upper lobe. 21st: transferred to children's ward under care of Dr. C. F. Harris. Temperature, 102° F. Pulse (sleeping), 140. Respiration, 48. Comatose, delirious, signs of consolidation have extended to the whole left chest. Hæmaturia. 22nd: discharging abscess in gum opposite first left upper molar; 5 c.cm. antistreptococcal serum given intravenously. 23rd: as a last resort, 130 c.cm. of paternal, citrated blood transfused. 26th: signs of fluid in left pleural cavity; patient considered too ill for exploration of chest. 27th: signs of left pneumothorax. Patient became more deeply comatose and died.

Pathological investigations.—Oct. 14th: white blood-cells, 17,400 per c.mm. Cerebro-spinal fluid contains 700 lymphocytes per c.mm. Cultures sterile. 21st and 26th: blood cultures positive. Growth in most heavily sown tubes in 48 hours and in all tubes in six days. 25th: pus from jaw abscess contains gram-negative bacilli with the morphological appearance of the blood culture bacillus. 27th: urine cloudy, albumin +, white blood-cells + +, red blood-cells +, hyaline, granular, and epithelial casts +. Gram film contains the blood culture organism, together with coliform bacilli and gram-positive bacilli of the vaginal type.

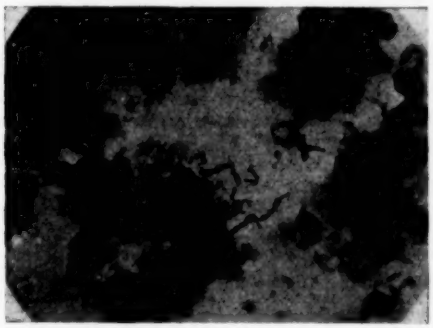
Abstract of autopsy report by Dr. E. R. Cullinan.—Right mastoid region is dry and clean; the remaining bone, meninges, and brain appear healthy. At level of first left upper molar is a small superficial gum abscess. There is a terminal pericarditis with slightly turbid effusion; right heart a little enlarged and hypertrophied. Right lung contains a few areas of collapse, emphysema, and broncho-pneumonia, with several small circumscribed abscesses in the lung substance, especially in lowest part of lowest lobe. Left pleural cavity contains gas and about 40 oz. of creamy pus, with a foul peculiar odour; the visceral pleura is yellow, firm, and a quarter of an inch thick in parts; no perforation could be found. Left lung is collapsed; there is some broncho-pneumonia and a few subpleural abscesses. At the base, and on the edge of the lower lobe, is an abscess three-quarters of an inch in diameter. Left hilum glands are infected, and there is some posterior mediastinitis. Peritoneum, stomach, and intestines are natural. Liver shows cloudy swelling and some fatty change. Spleen is somewhat enlarged, cut surface grey and slightly soft. Kidneys are pale, but otherwise natural, with no abscesses and no pyelitis. Bladder not infected. Suprarenals, pancreas, and genital organs are natural. Culture of heart's blood yields a pure growth of gram-negative bacilli. Spleen culture sterile. Pus from left pleural cavity; gram film shows mainly gram-negative bacilli, with a few gram-positive cocci in pairs, chains, and clumps.

THE CHARACTERS OF THE ORGANISM

The organism is a gram-negative, pleomorphic bacillus, occurring in films of pus in pairs and long chains, resembling in parts a gram-negative streptococcus, in others *B. influenzæ* (see Figure). In films of cultures longer and stouter bacillary forms are seen, but no fusiform bacilli, and no spirochætes. The length of single bacilli varies from 0·8 μ to 9·5 μ. They are non-motile and non-sporing.

Staining reactions.—Gram-negative; not acid-fast; no special characters with methylene-blue or carbol-thionin; no polar bodies with acetic acid-toluidine-blue.

Cultural characters.—Growth does not occur in the absence of blood or serum. Aerobic culture at 37° C. in blood-broth gives in 24 to 48 hours a uniform turbidity with a brown deposit and a characteristic fœtid odour. Serum broth remains clear with large flocculent deposits of growth. On



The pleomorphic gram-negative bacillus occurring in films of pus in pairs and chains. (From the first case.)

solid media there is no aerobic growth. Incubated anaerobically in McIntosh and Fildes jar on blood legumen or serum agar, small, round, flat, transparent colonies appear after 48 hours, growing into raised, translucent colonies with granular surface and crenated edge, 2 mm. in diameter. Subcultures from solid media into blood broth grew neither aerobically nor anaerobically. There is α-hæmolysis; no ancillary phenomenon with colonies of staphylococcus aureus; no growth in gelatin at 20° C., nor in litmus milk.

Sugar reactions.—Using serum-enriched media incubated anaerobically at 37° C. there was profuse growth without formation of acid or gas after 12 days in lactose, glucose, saccharose, mannite, raffinose, maltose, inulin, salicin, and galactose.

Hæmolysis.—On blood plates the organism produced α-hæmolysis. A mannite serum broth culture incubated anaerobically at 37° C. for 12 days was centrifugalised. 1 c.cm. of the supernatant fluid failed to cause hæmolysis when incubated at 37° C. for three hours with an equal quantity of 5 per cent. washed human red blood corpuscles suspended in normal saline.

Agglutinations.—The occurrence of clumping in the control tubes prevented the study of agglutination reactions. Viability and heat resistance were not tested.

The isolation of the organism in pure culture from the blood of both patients during life and its presence in the pus from the skull in the first case, and in the pus from the gum abscess, the pleural cavity, and in the urine in the second, leaves no doubt that it was the causative agent in these cases.

CONCLUSIONS

A review of the literature and a study of the two cases here recorded makes it certain that members of the fusiformis group, either alone or in combination, can produce both local abscesses and general blood stream infection.

The organisms probably inhabit the mucous membranes of the healthy body, and, as a result of local injury or general lowering of resistance, invade the tissues to produce fœtid abscesses, which may lead to pyæmia. Little attention has been paid to these organisms in this country, and scanty knowledge

together with the difficulty of culturing them, may account in part for the rarity with which their presence is recognised. It would be of undoubted value to study fœtid pus from gangrenous tissues by modern bacteriological methods, in order to identify the types of anaerobes present, their susceptibility to chemical agents (it must be remembered that *F. fusiformis* and Vincent's spirochætes are susceptible to arsenic), and their capacity for producing immune bodies, which might be of therapeutic service.

My thanks are due to Mr. Sydney Scott and Dr. Charles F. Harris for permission to publish the notes of these cases, and to Dr. L. P Garrod for his invaluable advice and guidance in the bacteriological investigation.

REFERENCES

1. Plaut, H. C.: Deut. med. Woch., 1894, xx., 920.
2. Vincent, H.: Ann. de l'Inst. Pasteur, 1896, x., 488.
3. Veillon, A., and Zuber: Arch. Exp. Med., 1898, x., 517.
4. Varney, P. L.: Jour. Bact., 1927, xiii., 275.
5. Peters, W. H.: Jour. Infect. Dis., 1911, viii., 455.
6. Dick, G. F.: Ibid., 1913, xii., 191.
7. Dick and Emge, L. A.: Jour. Amer. Med. Assoc., 1914, lxii., 446.
8. Pilot, I., and Pearlman, S. J.: Jour. Infect. Dis., 1923, xxxiii., 139.
9. Smith, D. T.: Oral Spirochætes and Related Organisms, London, 1932.
10. Vaucher, E., and Woringer, P.: Jour. méd. français, 1925, xiv., 141.
11. Rosenow, E. C., and Tunnicliff, R.: Jour. Infect. Dis., 1912, x., 1.
12. Larson, W. P., and Barron, M.: Ibid., 1913, xiii., 429.
13. Boez, L., and Keller: Bull. et mém. soc. méd., 1924, xlviii., 1757.
14. Boez, L., and Holtzmann, R.: Ibid., p. 1761.
15. Hegler and Jacobsthal: Med. klin. Woch., 1925, iv., 1940.
16. Buday, K.: Centralbl. f. Bakt., 1916, lxxvii., 453.
17. Davies, J. Conway: St. Bart.'s Hosp. Jour., 1927, xxxiv., 197.

A SPECIFIC TREATMENT FOR TRICHOMONAD VAGINITIS

BY JAMES ROBERT GOODALL, O.B.E., M.D. D.Sc. McGILL, F.C.O.G.

GYNÆCOLOGIST AND OBSTETRICIAN TO THE MONTREAL MATERNITY OF THE ROYAL VICTORIA HOSPITAL; CLINICAL PROFESSOR OF GYNÆCOLOGY AND OBSTETRICS IN MCGILL UNIVERSITY

IN September, 1931, I published a paper in the *Canadian Medical Journal* in which a new treatment for trichomonad vaginitis was outlined, with a record of results in 22 cases. The following is a summary of that paper.

THE INFECTION AND ITS TREATMENT

Trichomoniasis or trichomonad vaginitis is a disease caused by a flagellated plasmodial organism probably originating in the bowel, and *Trichomonas vaginalis* is considered to be the specific organism of this well-recognised clinical type of vaginitis. The disease is characterised by a profuse liquid purulent vaginal leucorrhœa, causing an associated diffuse vulvitis. The symptoms arising from the latter are an intense pruritus, intertrigo, and acute pain on urination, due to the contact of the acid urine with the inflamed mucosa of the vulva.

On introducing the bivalve speculum the walls of the vagina are injected and tender, and the vault is filled with a yellow or greyish-yellow, thin, purulent liquid containing bubbles of air. The vaginal walls and portio vaginalis frequently present the strawberry appearance due to papillitis.

The disease is not transmissible (so far as is known) to the husband. It is most frequently mistaken for gonorrhœa. It is acute and chronic. The acute cases are easily diagnosed clinically; microscopically, the diagnosis is readily confirmed by a hanging drop of pus and normal saline, or better still, by pressing a cover-slip down hard on a drop of pus. The organism is readily found by its motility and by the motion imparted to the pus cells in its immediate vicinity. It is impossible to demonstrate the organism during the douching treatment. Being a plasmodium, it readily succumbs in vitro to all the antiseptics, but, per contra, the disease produced is very tenacious as a vaginitis. The organisms disappear quickly after douching, but reappear a few days after cessation or after the subsequent menstruation.

The treatment presented here was prompted by the ineffectiveness and long duration of the generally accepted treatments. It consists in using an acid antiseptic in a medium which will slowly dissolve, thereby keeping the vagina in a constant bath of disinfectant. These two factors are obtained by using vaginal cones of 1 per cent. picric acid.[1] A cone should be inserted high up in the vault on retiring. A simple acid (lactic acid 1 drachm to the quart) douche should be used once daily, in the morning. After the first treatment with the cone, the whole vulva becomes stained a pale yellow, owing to the picric acid. The cone should be inserted blunt end first, so that the vaginal contractions tend to drive it to the vault. If inserted point first the same force tends to expel it from the vagina.

Ordinarily there is a strong tendency for the disease to recur immediately after the next or subsequent menstruation; a renewal of the cone treatment brings this recrudescence under control. Such a recurrence has taken place in only two of my cases, probably due to insufficient or improper coöperation. There is no contra-indication to continuing the treatment during menstruation.

So far I have treated 22 cases by this method—four of these during pregnancy; three in the puerperium. The results have been uniformly successful. The average course of treatment is from five to ten days, and owing to its great simplicity is not irksome. The pruritus usually disappears during the first three treatments and the pus is generally absent after the third or fourth day. Desquamation goes on for some time afterwards. By the tenth day the mucosa has taken on a healthy appearance.

The treatment may also be carried out with advantage during pregnancy, except perhaps during the last month of gestation. The distress from trichomonas infection during pregnancy is worse than at any other time. Should treatment begin just before menstruation the daily insertion of the cone may be continued throughout the period and for some days afterwards.

One of my patients had been previously hospitalised five times, one four times, and another twice for green soap lavage of the vagina and subsequent packing with gauze saturated with mercurochrome, iodine, and other hitherto approved forms of treatment with only temporary relief, followed by the discouraging reappearance of all the symptoms after the next menstruation. These cases subsequently responded quickly and, so far, permanently to a course of picric acid treatment.

FURTHER EXPERIENCE OF THE METHOD

Since the above results were published in September, 1931, 42 new cases have been under treatment. In all of them the organisms were found, and the clinical diagnosis verified by the microscope. In every case there was a rapid and permanent cure.

[1] As prepared by Wampole and Co., Montreal, Canada. Formula as follows: picric acid, gr. 1; formolid concentrated, grs. 10; sodium tetraborates, grs. 5; zinc borate, gr. ½; acetanilide, grs. 2; hydrastine, equal to tinct. hydrastis, 15 minims; boroglyceride with gelatin, grs. 100.

All the symptoms disappeared in from three to six days. There have not been any recurrences in any of the cases treated since September, 1931. Among these was one patient which had been treated for one year by green soap, vaginal antiseptic packings and insufflations, but was never completely free from symptoms for more than a few days at a time. She responded to treatment, of eight days' duration, with a complete cure. Another was under local treatment by a gynæcologist for nine months, and responded to the picric acid completely in six days. Another woman of a very nervous type who, owing to the intolerable pruritus, had not slept more than in snatches except when overcome by exhaustion, was able to sleep most of the first night of treatment and was completely free from symptoms after the third day. In only one of these cases has there been a failure. This one case was rendered much worse owing to her intolerance to picric acid. I have heard of two other such cases of idiosyncrasy to picric acid, in which the pruritus and urinary symptoms were greatly aggravated.

In two of the very acute cases in virgins, in which there were dozens of trichomonads in every microscopic field, each had developed signs of acute left side peritonitis when I first saw them. As there was no sign of venereal trouble, nor of tuberculosis, these cases were looked upon as trichomonad in origin, in which the organism had gained access to the peritoneal cavity probably through preternaturally patent Fallopian tubes. That unduly patent tubes do exist, with dire consequences, is being reported by me in another paper. In still another case, in which the urinary symptoms were very pronounced, the vesical condition did not improve perceptibly after cure of the vaginitis. The patient was then catheterised and the urine centrifuged, and in the sediment several typical organisms were found among the pus cells. Cystoscopic examination revealed a diffuse redness of the bladder and considerable œdematous reaction in the region of the trigone. Instillation of 1 per cent. picric acid into the bladder, with instructions to retain the same as long as possible, brought about a cure after five treatments.

It may be that other preparations of picric acid cones would be equally efficacious. When looking about for a suitable preparation of picric acid, in a slowly soluble medium, for this work, it so chanced that I fell upon the one quoted heretofore, and it is recommended merely because it has done the work so satisfactorily. It may be that the form of administration has a great deal to do with the efficacy of the treatment. It differs from a douche in permitting long contact. One of my colleagues aptly synopsised the matter by saying that the cone differed from a douche as a bath from a shower. The success of the treatment might be laid perhaps not wholly to the picric acid, but also to the long contact of the fluid that bathes the tissues overnight. Be that as it may, the results are so consistently uniform as to justify the statement that we are dealing with a specific, in combined action and administration.

TUNNY EXHIBITED FOR A HOSPITAL.—Two years ago a committee of ladies in the east ward of Scarborough began to raise a fund of £500 to endow a cot in Scarborough Hospital. By the middle of August £340 had been raised, when a sympathiser bought a tunny just caught some miles off the town and exhibited it for the benefit of the fund. More than 24,000 paid to see the original fish and a successor, and the net profit of £160 that resulted completed the required amount.

BRITISH MEDICAL ASSOCIATION

ANNUAL MEETING IN DUBLIN

SECTION OF PATHOLOGY AND BACTERIOLOGY

AT the final meeting of this section, with Prof. T. T. O'FARRELL, vice-president, in the chair, a discussion on

Renal Functional Disturbance

in acute and subacute nephritis was opened by Dr. J. SHAW DUNN (Glasgow). The most baffling problem in nephritis, he said, was œdema. In earlier times it was assumed that œdema was the result of ineffective excretion of fluid by the diseased kidneys. In recent years, however, this explanation had been questioned. The fundamental objection to the theory was the absence of œdema in complete anuria resulting from blockage of both ureters or accidental removal of a solitary kidney. In such cases, moreover, there was no evidence of an increase of body-weight, whereas in cases of œdema, weight increased as the fluid in the tissues increased, and decreased as the œdema disappeared with diuresis. Various pathological lesions had been described in cases of nephritis associated with œdema, in some of which tubular changes predominated; the excretion of water, however, was more likely to be a glomerular function. Five types of nephritis in which œdema was a common symptom might be recognised—namely, acute diffuse glomerulo-nephritis; subacute glomerulo-tubular nephritis; nephrosis; amyloid kidney; and the nephritis of pregnancy. These conditions differed in their pathology: in glomerulo-nephritis, for example, there was blockage of the lumina of the tuft capillaries by endothelial cells, whereas in amyloid disease and nephrosis there was no such blockage, and in the nephritis of pregnancy the blockage was intermediate in degree. In acute nephritis and nephritis of pregnancy, moreover, there was often no change in the tubular epithelium, whereas degeneration was marked in the other three. In all five conditions the lesion was diffuse, the tufts were permeable to protein, and the tubular tissue persisted in bulk though degenerative changes might be more or less in evidence.

According to Widal, œdema was due to retention by the diseased kidneys of common salt, fluid being retained to preserve isotonicity. If he had spoken of retention of physiological saline rather than common salt his argument would have been less open to attack. It had been objected that marked salt retention might occur in chronic interstitial nephritis without œdema resulting; and that in some nephritic œdemas, notably in nephrosis, the blood showed no increase of water or salt, but might be concentrated. Arguing from this, Volhard thought that œdema was due to injury by toxins of capillary walls throughout the body, with the result that water and salt escaped, leaving the blood more concentrated. It had been pointed out, however, that the capillaries could not well be more permeable than usual to water and salt while, at the same time, the low protein content of the œdema fluid indicated that they were less permeable than usual. In this connexion it was worth noting that samples of blood examined in nephritis associated with œdema were usually taken from a vein; venous blood, returning from the tissues, must have contributed a certain amount of water and salt to the œdema fluid, and therefore

differed from the blood going to the kidneys for purposes of elimination. Kylin had found that, while œdema was increasing, the colloid osmotic pressure of arterial blood was lower than that of venous blood, but during resolution of œdema the reverse was the case, because the venous blood was diluted by fluid from the tissues. The low salt and water values in the venous blood of nephrotic cases were no fair indication, therefore, of the salt and water values in the arterial blood.

According to another theory, in œdema the plasma proteins were diminished owing to loss by albuminuria, and consequently the power of the blood proteins to hold fluid in the capillaries against the hydrostatic pressure which tended to drive it out was much lessened. But the amount of œdema did not always correspond to the decrease of plasma protein, and the resolution of œdema in nephrosis occurred without the previous rise in osmotic pressure in the blood which might be expected. It was also difficult to explain the œdema of acute glomerulo-nephritis and of nephrosis upon the secretion theory of kidney action. The filtration-reabsorption theory was more promising; according to this hypothesis, it might be supposed that owing to partial blockage the glomerular capillaries could no longer produce sufficient filtrate by working in relays, but all had to work continuously. The filtrate produced would be distributed to all the tubules, with the result that reabsorption would be increased.

Dr. W. CRAMER (London) said that the view was generally taken that fluids were retained in the tissues by osmotic pressure, but he thought that the force of imbibition probably played a part. He had been able to show during the past two years an unexpected relationship between inorganic salts and the normal functions of the kidney. Animals fed on a synthetic diet, properly balanced and containing a sufficient vitamin content, were found to develop nephritis if magnesium salts were omitted. The nephritis was progressive, finally leading to interstitial fibrosis. It was not possible to produce this effect by leaving calcium or sodium salts out of the diet, nor was it obtained when both calcium and magnesium salts were omitted. He suggested that the nephritis was due to a disturbance of the physiological balance between these two salts. Pathologically the nephritis began as a degeneration of the glomeruli followed by tubular changes which he thought were secondary to the complete or partial glomerular occlusion. He had not been able to produce œdema up to date. These observations demonstrated that nephritis could result from disturbance in the equilibrium of inorganic ions in the absence of a toxic substance, bacterial or otherwise. In practice it was possible that imbalance of these ions might expose the kidney to the danger of injury from toxins or other agents which normally would be harmless. From the preventive aspect it might be worth while supplying a diet rich in magnesium to patients suffering from diseases of which nephritis was a common sequel.

Prof. J. T. WIGHAM (Dublin) said that certain factors deserved consideration in formulating any theory of nephritis. First, there was the reserve power of the kidney; in arterio-sclerosis a large number of glomeruli might be obliterated without ill-effect on the patient. Secondly, the kidney was supplied by a double set of capillaries, either or both of which might be affected in nephritis. Thirdly, in his opinion the kidney changes in nephritis must be regarded as having a toxic origin; the kidney cleaned the blood and the glomerular tufts were exposed to injury by toxins in the circulation, as were capillaries in other parts of the body. He thought that the albumin in the urine in nephritis was not necessarily all derived from leakage through the glomerular tuft. It was probably derived in part from tissue debris in the injured tubules. Osmosis, he considered, was largely responsible for the escape of fluid from the blood through the tuft. Salts passed readily from fluids of greater concentration to fluid of less concentration—in other words, they followed the water. The mechanical effects of swelling of the epithelial cells had an influence on the passage of fluid through the renal tubules; in cases of oliguria, the filtering effect of the blood pressure was probably negatived by the blocking of the tubules. In view of the complexity of the problem it was impossible to put œdema down to one factor only; probably there was an interplay of several factors.

Dr. JOHN GRAY (Aberdeen) said that while, in acute and subacute nephritis, glomeruli, tubules, and vessels were all affected, the glomerular changes were probably the most important, especially if it was accepted that the glomeruli were filters, and that the filtrate was concentrated by reabsorption in the tubules. In acute and subacute nephritis the glomerular filters were partly choked and were less selective. Albuminuria in nephritis was too considerable to be accounted for by the cells and debris of the deposit, and leakage of protein from the blood stream was the only feasible explanation. Oliguria was probably caused by diminished filtration through the inflamed glomeruli. Increased capillary permeability might be a factor in acute and subacute nephritis. There was some reason to think that nephritis was due to an allergic effect on the glomerular capillaries, and if this was so capillaries throughout the body might suffer damage which was not obvious histologically. It was true that the protein content of œdema fluids of inflammatory origin was much higher than the protein content of nephritic œdema; but the urine itself, in nephritis, might not contain as much protein as inflammatory œdema fluid, and in any case the actual filtrate passing the inflamed glomeruli must have much lower protein content still. The œdema of the later stages of nephritis, he admitted, could not be explained plausibly on a theory of increased capillary permeability, and in these cases he favoured the theory that œdema was due to lowered plasma osmotic pressure. It was wise, he thought, to admit that we did not know the cause of raised blood pressure in nephritis. In neither nephritic hypertension nor uræmia was there any direct evidence for attributing the symptoms to retention of an unidentified substance by the kidneys. To say that the hypertension was compensatory was merely to disguise our ignorance.

Dr. F. H. SMIRK (London) said that the percentage of protein in the plasma was diminished in famine œdema owing to reduction in the protein of the diet, and the same state might be produced experimentally in animals by a process of plasma pharesis. In such cases, provided the percentage of protein in the plasma was sufficiently reduced, œdema would develop despite the fact that renal function was normal. This was of interest as an illustration of simple hypoproteinæmic non-renal œdema. Referring to the origin of the albumin in the urine in nephritis, he said that experiments on fish had shown that certain toxic substances would produce albuminuria in fish with renal glomeruli which failed to do so in certain aglomerular fish, although damage to tubules in the second class of fish was marked.

In replying, Prof. SHAW DUNN remarked that famine œdema did not occur unless there was salt in the diet.

Cerebral Tumours

Dr. W. E. CARNEGIE DICKSON (London) read a short paper, illustrated by lantern slides, on the variability and multiplicity of cerebral tumours. He would omit, he said, all discussion of gliomata. Twenty-three years ago he had published a case of tuberose sclerosis, in which, in addition to the cortical and ventricular nodules in the brain there was a rhabdomyoma of the heart; in this condition "dislocation" tumours were commonly found in the brain, kidney, heart, and skin, and, more rarely, the pancreas, duodenum, thyroid, and breast. Lindau's disease was another example of such a multiple tumour syndrome, there being often, in addition to the characteristic hæmangio-blastomatous cyst of the cerebellum, an angiomatosis of the retina and perhaps cavernous angioma of the liver and cystic disease of the kidneys and pancreas. Closely allied to tuberose sclerosis, he considered, was von Recklinghausen's disease or multiple neuro-fibromatosis. In a recent case which he had examined an extraordinary variety of tumours was present; not only were there large bilateral acoustic nerve tumours, but innumerable smaller tumours upon nearly all of the cranial nerves. In addition, there were about 50 meningiomata of various sizes, some of them projecting into the lumen of the sagittal sinus. The posterior nerve-roots and the cauda equina were covered with small tumours, and there were also numerous intramedullary tumours, some of them similar to those found on the nerve-roots, but others apparently fibrillary astrocytomas. The patient had had a subcutaneous neurofibroma removed from his shoulder at a previous date, but no other subcutaneous tumours were found post mortem; a single minute tumour was found on one of the sciatic nerves. In another curious case the patient, a woman of 42, had an 11 years' history suggesting a right motor cortical lesion. She died, following operation, from a localised meningitis due to rupture of an infected pituitary cyst, and was then found to have a cavernous angioma of the parietal lobe, associated with multiple tumours at the base of the skull, some of them containing cavernous vascular spaces. In the roof of the pharynx and the body of the sphenoid there was an extensive myxo-chondro-adenoma, apparently arising from mucous glands. The pituitary fossa showed developmental abnormalities.

Dr. T. B. DAVIE (Liverpool) discussed the criteria of malignancy in relation to gliomata. In other parts of the body than the brain, he said, the criteria of malignancy were: (1) progress to a fatal issue; (2) peripheral invasion of other tissues; (3) the occurrence of metastases; (4) a limited survival period; (5) the specific histological picture. In the case of cerebral tumour, invasion of neighbouring tissue did not necessarily indicate malignancy: a pathologically malignant tumour might be delimited, while a benign tumour, such as an astrocytoma, might be invasive. The occurrence of metastases depended chiefly on the opportunity for tumour cells to enter the cerebro-spinal fluid. The rate of growth of a cerebral tumour could not be judged accurately, since the survival period could only be estimated from the date of onset of symptoms. The course was further influenced by the position of the tumour in relation to vital centres, the development of hydrocephalus, the occurrence of hæmorrhage, or the results of operation. Cushny and Bailey, in their classification of gliomata, put medullo-epitheliomata at the head of the list because the average survival period of patients with these tumours was only eight months. Pathologically, however, these tumours were benign. They developed from cell rests of a primitive type, and the tumour cells were therefore primitive, but there was no evidence of true anaplasia or malignancy. These tumours arose in proximity with the ventricles and caused death by giving rise to hydrocephalus. Because of the short survival period students were apt to regard medullo-epitheliomata as malignant. Further investigation of the pathology of cerebral tumours was called for in order to draw a distinction between pathologically malignant growths and growths which were rapidly fatal clinically.

Dr. JOHN MCGRATH (Dublin) said that the pathologist was commonly asked by the surgeon to give a name to a piece of tumour removed at operation, and to offer an opinion on prognosis. Dr. Dickson had shown that a small portion of tumour was not enough to justify a diagnosis, because the structure of the tumour might vary so much in different parts; while Dr. Davie had emphasised the fact that pathological malignancy was not the most important factor in prognosis. Moreover, Dr. Dickson had impressed on the meeting the necessity for a complete post-mortem examination. On the whole these speakers had added considerably to the burden on the pathologist. He asked whether variability and multiplicity were frequent characteristics of cerebral tumours.

Mr. A. B. CLERY (Dublin) said he had seen one case of tuberose sclerosis in which an ependymoma was present, but was inclined to think the association of the two accidental. In a series of 75 cases he had found 60 per cent. of gliomata, and of these 65 per cent. were examples of spongioblastoma multiforme; 12 per cent. were tuberculomata. He recommended the practice of biopsy; a small portion of tumour was removed with the diathermy loop or an aspirating needle and examined microscopically at a side-table during operation. The surgeon could usually learn enough from this examination to decide his course of action, and he could return to the operating table within a very few minutes.

In replying, Dr. DICKSON said that tuberculomata had now become extremely rare in England.

SECTION OF PHARMACOLOGY AND THERAPEUTICS

Prof. R. J. ROWLETTE (Dublin) presided over this section, and there were two discussions. The first was on

Diuretics and their Uses

Prof. D. MURRAY LYON (Edinburgh), in opening, defined diuresis as an increased flow of urine, irrespective of the composition of the fluid or its source, and distinguished two types—endogenous and exogenous. The subject of water balance, he said, was by no means simple, for the intake included not only the fluid drunk and the water content of foods, but also water as a metabolic end-product, 100 g. of fat yielding 107 g. of water. Moreover, removal of water was effected by the skin and expired air to the amount of a litre daily, closely corresponding to the metabolic rate. Diet also was a complex factor, for apart from the fluid content of foods, carbohydrates favoured water storage, and fats released fluids from the system.

A difficulty in using diuretics was that their function in disease was not necessarily the same as it was in health. The effect of digitalis and squill, in causing increased urinary output and relief of cardiac dropsy, depended on favourable posture and rest in bed, and the result was hastened by a dry diet and limitation of salt. Strophanthus and the xanthine series were uncertain and less lasting in effect, and were liable to damage the kidneys. Urea in doses of 10 to 15 g. seemed to be safe in its action, giving rise to prompt and marked diuresis, but should be withheld if there was nitrogen retention. It had proved of value in both cardiac œdema and chronic nephritis, but caused nausea if given continuously. The salts most used for saline solutions were citrates and acetates of potassium and ammonium, generally given in combination. Though probably without effect in cardiac disease, they might have a beneficial action in nephritis, but this depended on circumstances. Their conversion to carbonates caused alkalinity of urine, and this change favoured the retention of fluid in the tissues; neutral salts, on the other hand, induced acidosis and encouraged the dissipation of fluid. Water as a diuretic was of most use in infections and local lesions of the urinary tract, and in large amount it helped to rid the system of sodium chloride; but in cases of œdema it was a safe diuretic only when the salt intake was limited. Of the mercurials, whilst calomel and Guy's mercurial pill in daily purgative doses held an old reputation for creating loss of fluid and so relieving the heart, the greatest success had of late been attained with organic preparations, such as novasurol and salyrgan. Both were described as efficient and reliable drugs issued as sterile fluids for intramuscular inoculation. Salyrgan had proved very useful in relief of cardiac œdema and was less likely to cause mercurialism than novasurol. Of the hormones, adrenaline and pituitrin were known to have diuretic properties, whilst thyroid was the most important, especially in chronic nephritis with œdema, but was contra-indicated in cases with circulatory failure. Intravenous gum saline had proved of apparent benefit, especially when followed by blood transfusion, in cases of œdema dependent on reduced plasma proteins.

In cardiac cases a dry diet was often helpful, whilst a salt-poor diet and a low protein intake were essential for the control of dropsy, although in the chronic stage a normal or high protein diet might be more beneficial. Decapsulation of the kidneys was of value in anuria or when the urinary output was very small.

Prof. L. ABRAHAMSON (Dublin) said that from 1785, when digitalis was first introduced by Withering, until recent years there was little advance in the diuretic treatment of cardiac dropsy. Up to 1920, diuretics of the purine group, such as theobromine and Theocin, had been chiefly relied on, but they were uncertain in their effects. In 1920, however, the therapeutics of œdema reached a surer footing with the discovery of the diuretic action of novasurol, first used in Germany in 1917 for syphilis. The less toxic compound salyrgan marked a further improvement in 1924. Its mode of action was still undecided, but it was said to liberate water and salt from the tissues and to cause depression of the cells of the renal tubules. In 10 per cent. aqueous solution, given intramuscularly or intravenously for cardiac œdema, salyrgan caused diuresis for 24 to 48 hours, with output of 90–200 oz. of urine in the first 24 hours. He had adopted the routine method of a first dose of 1 c.cm. given intravenously in the early morning, followed by 2 c.cm. every fourth or fifth day, accompanied by routine digitalisation, tapping of hydrothorax, restriction in the amount of fluids, and administration of ammonium chloride grs. 10 to 20 three times daily. He had used salyrgan for dyspnœa in severe heart failure for the past five years without experience of any toxic effect, and had found it an important means of saving life, when digitalis was no longer effective.

The treatment of renal œdema by the use of diuretics was more complex, because of the difficulty of classifying cases of nephritis. In pure nephrosis there was more likely response to the diuretic action of ammonium chloride and nitrate in doses of grs. 15 to 30 thrice daily. Owing to the tendency to acidosis, great caution was necessary in using these salts in cases with renal insufficiency, their diuretic action being enhanced by salyrgan, and they should be withheld in acute nephritis for fear they should precipitate uræmic convulsions. In subacute or chronic nephrosis, however, they could be given with impunity, ammonium nitrate for preference, because of its greater diuretic effect. The use of calcium salts, in doses of 12 to 18 g., had been advocated for the relief of massive œdema, calcium chloride being safer than the ammonium salt, though less effective and more likely to cause gastro-intestinal irritation. In acute nephritis with scanty urine or anuria, 10 oz. of 20 per cent. glucose solution given intravenously once or twice daily had been found of value.

Prof. Abrahamson concluded by pointing out that for 150 years mercury had been used in heart failure, and that in 1679 Thomas Willis had recommended salts of nitre.

Dr. F. H. SMIRK (London), in discussing the difference between the diuretic action of urea in health and in nephritis, described his experiments to ascertain the output of chlorides in the urine before and after a dose of 15 g. of urea given in 100 c.cm. of water. In normal subjects the chlorides rose to 0·8 per cent., but in nephritis cases the increase was less. Determinations also showed that after taking the urea the plasma chlorides in the normal subject were less than the urinary chlorides, whereas the converse was always seen in nephritis, the urea percentage rising as the chloride output fell. He put forward the hypothesis that in advanced nephritis the damaged cells of the tubules could not resist the diffusion of water, and the raised pressure of the tubular urine withdrew water from the blood by osmosis into the tubules, diffusion continuing until the pressure in the urine and blood was equal; thus he accounted for the polyuria of advanced nephritis and the inverse relationship between the percentage of chloride and urea in the urine.

The PRESIDENT said it was not yet known how mercury acted as a diuretic.—Dr. DOROTHY HARE (London) mentioned the diminished output of urine in cardiac œdema under the influence of massive doses of digitalis as an early indication of complete digitalisation, usually attributed to the drug's toxic action on the heart. She asked if it was possible to distinguish that effect from the action of the transitory vasoconstriction alluded to by Prof. Lyon.

Prof. MURRAY LYON said he did not regard the decreased volume of urine as due to the toxic effect of digitalis. In hydrothorax the removal of a few ounces of fluid might improve diuresis.

Anæsthetics from the Practical and Scientific Aspects

Mr. F. J. MORRIN (Dublin), in opening a discussion on anæsthetics, spoke of the use of basal narcotics

and the importance of securing pre-operative amnesia. Of the drugs employed, he thought Avertin the most useful. He condemned the practice of employing a basal narcotic for a patient receiving a spinal anæsthetic, for the combination might reduce blood pressure excessively. In spinal anæsthesia his own experience had been almost confined to novocain and percaine: the former, in 5 per cent. solution and doses of 10 to 12 mg., had proved the most reliable for anæsthesia below the umbilicus; the latter, in 1 in 5000 solution, was preferable for high abdominal anæsthesia. The disadvantages of spinal injection were the difficulty of localising the level of anæsthesia, and the post-operative headache; the headache occurred mostly in anæmic patients, and was relieved by 15 to 20 per cent. saline solution given intravenously.

Dr. R. W. SHAW (Dublin) remarked on the lack of progress in the art of anæsthesia as compared with surgery, and the sole reliance until recent years on ether and chloroform. For basal anæsthesia he had had most experience with avertin, but the risk of its toxic effects had led to its displacement by Nembutal for long operations, and by Evipan for short ones. The evidence in favour of the newer barbiturates was overwhelming. For spinal anæsthesia he gave preference to percaine, preceded by induction of sleep with nembutal given by mouth. In the present state of anæsthetics, however, it must be admitted that ether preceded by nitrous oxide was the most applicable in the majority of cases. The use of the mask and drop-bottle had passed for ever.

Dr. A. R. PARSONS (Dublin) spoke chiefly on the importance of using a pure anæsthetic, whether ether or chloroform. There was a simple method of ridding ether of poisonous products such as acids and unsaturated chemical compounds which were a real danger to the patient, and tests should be applied for them. For pre-anæsthesia, nembutal represented a great advance; after 1 c.cm. the patient passed within a few moments into quiet sleep, and subsequently only a small amount of ether was required for maintaining anæsthesia. It was also of proved value in dental extraction. At the same time a risk attached to the intravenous use of nembutal which called for both care and experience, though there was little if any risk in the absence of hepatic and renal disease. He regarded ether as the safest anæsthetic; chloroform, although scarcely dangerous to a child, might cause sudden cardiac failure in an adult. But why, he asked, was there now always more basal pneumonia? He attached great importance to the sterilisation of apparatus in contact with the patient's mouth, and as the ether bag was difficult to sterilise, he advocated the use of a paper bag; further he emphasised the necessity of attention to mouth antisepsis before a patient was anæsthetised.

Dr. SMIRK spoke of the antidiuretic effects of anæsthetics and narcotics, and their reduction of the urinary output—a result assumed to be due to interference with the mechanism regulating water excretion by the kidneys. He had studied the effect of anæsthesia on the absorption of water from the gut in rats, and found that absorption was always delayed, whatever the anæsthetic used. His observations suggested that the depression of renal activity after anæsthesia was due to failure of absorption of the water supplied, which affected the partition of fluid between the blood and the tissues, and that anæsthetics might thus help to establish the state of surgical shock by increasing the concentration of hæmoglobin in the blood. It was not unlikely that the inhibitory effect of ether and chloroform upon diuresis applied to man as well as animals, and he thought the anæsthetist should consider the advisability of omitting morphia injection, and restricting anæsthesia to the use of nitrous oxide and oxygen, for operations in relief of urinary obstruction or in renal decapsulation, in order to minimise the retardation of the urinary flow.

Dr. G. H. MORISON said that sodium evipan, which though a barbiturate was not a basal anæsthetic, had not been produced as an anæsthetic, but was a chance discovery in the course of work in Germany on hypnotics. The quantity of hypnotic excreted in the urine varied considerably, thus some 70 per cent. of veronal escaped unaltered; luminal with a more rapid effect showed 10 to 12 per cent. excreted unchanged, whilst only 2 to 2½ per cent. of evipan could be recovered in the urine. In doses of 0·25 g. this drug induced sleep in 10 to 20 minutes. The soluble sodium salt given intravenously in very small amount had much the same effect as nitrous oxide, with sleep lasting 10 minutes, and was therefore of value for short operations, such as the removal of teeth or nails.

Dr. H. QUINLAN (Dublin) was convinced of the value of disinfecting Clover's inhaler, and of the need for antiseptic attention to the mouths of patients, in order to reduce the risk of pulmonary abscess. Introduction of the tube into the airway favoured the direct action of ether on the larynx and encouraged the aspiration of blood or material from the nasal passages into the lungs. The rate of elimination of anæsthetics was of importance in connexion with lung complications; and after-effects should be carefully watched to allow of the early diagnosis and localisation of such sequelæ as pleurisy and pulmonary abscess.

INTERNATIONAL CANCER CONGRESS.—This congress will be held at Madrid from Oct. 25th–30th under the presidency of Dr. Sebastian Recasens, and both scientific and social aspects of the disease will be discussed. Dr. William Cramer and Dr. E. G. Annis will be among the English representatives, and Dr. J. A. Murray will speak on experimental cancer. The secretary-general of the congress, Don Julio Bejarano, may be addressed at the Facultad de Medicina-Decanato, Atocha, 104, Madrid.

AUTUMN CONGRESSES AND COURSES IN PARIS.—The first congress for the study of the photographic and cinematographic documentation of the medical sciences will be held at the Musée Pédagogique de l'État, 29, rue d'Ulm, Paris, from Oct. 5th to 7th. Dr. Charles Claoué, 39, rue Scheffer, is acting as scientific secretary to the congress, and the organising secretary is Mr. Michel Servanne, 48, rue de Romainville.—The fifteenth annual meeting of the French Society of Orthopædics will take place on Oct. 13th and 14th at the faculty of medicine, under the presidency of Prof. Mathieu, of Paris, the main subjects for discussion being the open reduction of congenital dislocations of the hip (Prof. Mutel, of Nancy), and chronic arthritis of the vertebral column (Dr. André Richard, of Berck). The secretary-general of the congress is Prof. H. L. Rocher, 91, rue Judaique, Bordeaux.—Two post-graduate courses have been arranged for October. From Oct. 9th to 21st there will be a course on diseases of the heart and blood-vessels at l'Hôpital Broussais, 96, rue Didot, Paris, under the direction of Dr. Charles Laubry. The course will seek to deal with the important cardiac syndromes from a new aspect; further information may be had from Dr. Dany at the hospital. From Oct. 16th to 27th a course on diabetes mellitus will be held under the direction of Prof. F. Rathery at the Clinique Thérapeutique Médicale de la Pitié. The details are obtainable from the secretariat of the faculty of médicine, Paris.

REVIEWS AND NOTICES OF BOOKS

Atlas of Otology

Volume II. By ALBERT A. GRAY, M.D., F.R.S.E., formerly Lecturer on Diseases of the Ear, Glasgow University. Glasgow: Jackson Wylie and Co. 1933. Pp. 72. £6 6s.

THE first volume of this atlas appeared in 1924, and its successor has been eagerly expected. It contains 91 plates which are exquisite reproductions of specimens largely prepared by Dr. Gray himself, although several have been made from tissues fixed by the intra-vitam method by Mr. C. S. Hallpike of the Ferens Institute. All the photographs, except two by this worker, have been taken by Dr. Gray, and must represent many hours of laborious work. Some are stereoscopic pictures, fewer than in the first volume, and a small stereoscope is provided in a pocket in the binding. As they are all flat specimens, the stereoscopic method is not so helpful as it was in the former volume. The first 24 plates deal with normal anatomy, chiefly of the organ of Corti, and show what is probably the true shape and position of the tectorial membrane when not distorted in the process of fixation. The pathological specimens include further examples of otosclerosis, with the investigation of which Dr. Gray is closely identified, and cases of otitic meningitis, of acusticus tumour, of senile degeneration, and of congenital malformation. This is a unique presentation of specimens relating to the anatomy and pathology of the ear which of all regions of the body is the most difficult of study.

Treatment of Rheumatoid Arthritis and Sciatica

Second edition. By A. H. DOUTHWAITE, M.D., F.R.C.P. Lond., Assistant Physician, Guy's Hospital; Honorary Physician, All Saints' Hospital. London: H. K. Lewis and Co. 1933. Pp. 131. 6s.

IN its second edition this book has been extensively revised and brought up to date by inclusion of the results of recent research; amongst other subjects the question of the blood-sugar is discussed, and a chart given of the average blood-sugar curve in 32 arthritics. The importance of Oriel's proteose is considered, the author giving his opinion that if used intelligently the value of the injection of proteose is unquestionable. An addition of considerable importance to this edition is a consideration of sciatica, and it is most heartening to read in the preface to this edition that the most cogent argument in favour of the inclusion of this disease is the fact that its treatment is so often satisfactory. The use and importance of manipulative treatment is stressed particularly in the presence of stiffened and deformed joints, and also in treating sciatic neuralgia. Suitable cases for this form of treatment are described with details of methods to be used, while a strongly worded warning is given of the dangers of unskilful practice. Another form of treatment described and recommended for central sciatica is intrasacral injection of saline, which when combined with manipulation is said to give a high percentage of successes. This book can be commended to those who wish to give their patients treatment based on sound principles, as sound as can be formulated in our present stage of ignorance of the ætiology of this disease, and to enable them to regain a measure of their former health.

Leçons sur l'alimentation

By GIOVANNI LORENZINI, Professeur de Chimie biologique à la Faculté de Médecine de l'Université Royale de Milan. Paris: Masson et Cie. 1933. Pp. 324. Fr.36.

A BOOK on practical dietetics by an author who is primarily a biochemist is a novelty in the literature of the subject. It should at least ensure a scientific approach, an avoidance of fads, and an adequate consideration of the chemical and physiological basis of dietetics. This is certainly true of Prof. Lorenzini's book. In the first six chapters he deals fully and in the light of the latest researches with the metabolism of the different nutritive constituents of foods and with the factors which regulate the bodily exchanges including the vitamins. The chemical composition of foodstuffs is described succinctly but adequately in a single chapter, and the rest of the book is devoted to nutrition in health and disease. The author writes with clarity and concentrates on principles rather than on details, and although he appears to be quite familiar with the latest investigations the text is not overburdened with references to authorities. He founds his directions for the dietetic treatment of disease upon the chemical pathology of the particular affection and avoids going into minutiæ, nor does he supply the reader with the elaborate menus which are becoming a tiresome feature of many modern treatises on diet. The book may certainly be read with profit by every practitioner who is anxious to give rational advice about food to his patients, but it may still be doubted whether dietetics is as yet such an exact science as the author would have us believe. In his very last sentence he really sums up the truth of the matter: "Manger peu, mais de bonnes choses, est le fin du fin de l'hygiène alimentaire." It is a pity that the book is not provided with an index.

Pediatrics

Series 1932. The Practical Medicine Series of Year Books. Edited by ISAAC A. ABT, M.D., Professor of Pediatrics, Northwestern University Medical School. With the collaboration of ARTHUR F. ABT, M.D., Assistant in Pediatrics at the school. Chicago: Year Book Publishers, Inc. 1933. Pp. 564. $2·25.

THIS volume provides a very large number of abstracts of articles concerned with pædiatrics published during the year 1932. It is a commonplace that it is almost impossible for even the specialist nowadays to keep up with the literature of his own subject, and the pædiatrician particularly has to watch many fronts along which advance is being made. The editors have been successful in what must first have appeared an almost hopeless task, and have provided abstracts which mostly do more than just let the reader judge whether he wishes to read the original article or not. The editorial comments are in comparison somewhat disappointing. While it is difficult to generalise from such diverse subject matter as is here included, it would seem that amongst the most striking advances made during the past year have been those concerned with immunisation and specific therapy of the acute specific fevers, though in anterior poliomyelitis the results of serum treatment are difficult to assess and are certainly less impressive than was at first hoped. The book has a number of well-selected illustrations,

and is brightened by a few secretarial lapses—as, for instance, where "M.B. Edin." is given as the co-author of a paper.

Surgical Pathology

Third edition. By WILLIAM BOYD, M.D., M.R.C.P. Edin., F.R.C.P. Lond., Dipl. Psych., F.R.S.C., Professor of Pathology, University of Manitoba; Pathologist to the Winnipeg General Hospital. London: W. B. Saunders Company. 1933. Pp. 866. 50*s*.

ALTHOUGH shorter by about 60 pages than its predecessor, this new edition is no less comprehensive. There has been considerable condensation without the sacrifice of any essentials. Some new material has in fact been added, including short sections on the metabolism of tumours and on many other subjects. The chapter on healing has been merged into that on inflammation, saving much space, whilst the whole chapter on the thyroid, along with many other sections, has been rewritten. Prof. Boyd discusses the confusing problems of thyroid diseases in a lucid and critical manner, and has succeeded in giving a clear picture of the present state of knowledge on the subject. Prof. Boyd has established his reputation as a vivid writer, not only in this work but also in the two other important pathological text-books which he has produced within the last two years. He is able to impart his enthusiasm to the reader, and to instil a feeling of confidence. To the student contemplating higher degrees in surgery this text-book is almost indispensable.

L'hérédo-syphilis

Clinique et Thérapeutique. By Dr. JEAN HUTINEL and Dr. ALICE LINOSSIER-ARDOIN. With a preface by Prof. V. HUTINEL. Paris: Gauthier-Villers et Cie. Pp. 302. Fr.35.

THIS volume is the eighth to appear of a series of monographs by French writers on pædiatrics and puericulture. It opens with an introductory chapter by Prof. V. Hutinel, who tells us that when he was Parrot's house physician in 1876 he spent many hours with that master in the post-mortem room and in their small laboratory, carefully examining the tissues and organs of syphilitic babies and children. Since that time he has devoted his life to the work and has written much upon the subject, the final outcome of his experience being a book entitled "Le Terrain Hérédo-Syphilitique," published in 1926. Herein, in addition to the direct manifestations of hereditary syphilis, he dealt with signs and symptoms which he regards as indirect results of syphilis—either interference with growth or dysfunction of glands of internal secretion.

An early chapter in the work now under review is devoted to a comparison between the French views on congenital syphilis and those of the German school, with the latter of which most authorities in other countries are in agreement. The authors state that in this monograph they have adopted the French conception of congenital syphilis, as it has been evolved from the researches of A. and Ed. Fournier, Parrot, Hutinel, and Marfan, yet avoiding the extreme view of Leredde and others, who maintain that a very large percentage of the population suffers from congenital syphilis. There is possibly more to be said for the moderate French view—that obscure ailments in children and even adults may be due indirectly or directly to a syphilitic taint—than is generally admitted in this country; for Nabarro has recently brought forward evidence to show that syphilis in three generations of a family is by no means rare, and that latent or obscure syphilis may be elicited if carefully looked for. This book gives a good description of the symptoms and diagnosis of congenital syphilis, and in the first part, devoted to the clinical study of the disease, the authors have had the collaboration of Dr. G. Patey, of Dr. A. Ceillier on mental troubles, of Dr. H. P. Chatellier on the oto-rhino-laryngological manifestations, and of Dr. H. Lagrange on eyes. One is astonished to find that one short page and a half, without any illustrations, suffices to dispose of the dental manifestations—the description of the "mulberry" or Moon's molars being particularly inadequate.

The second part of the book—the therapeutical study of the disease—is better than the first. It goes fully into the details of treatment of the various phases of the disease with the different drugs available. Among the many bismuth preparations referred to, bismuth oxychloride is not even mentioned, although this is probably the drug most extensively used in this country at the present time. The book is well printed, but some of the reproductions of the radiograms of the bones, showing various degrees of osteochondritis, are poor.

Colds and Hay Fever

By FRANK COKE, F.R.C.S. Minor Monograph Series. London: Baillière, Tindall and Cox. 1933. Pp. 148. 5*s*.

AFTER a description of the functions of the nose, Mr. Coke gives a full account of the many investigations into the causation of the common cold, leading up to and including those of Dochez, Shibley, and Mills, which go far to prove that the actual ætiological factor is an ultra-microscopic filtrable virus. In conformity with this view, he does not observe any benefit from anticatarrhal vaccines. Menthol, he finds, gives a sensation of clearness, but actually closes the nasal air-way. In the treatment of hay-fever he relies partly on desensitisation with pollen extracts, and partly on the injection of non-specific proteins. Horse serum is ruled out for this purpose as dangerous to many people, and Mr. Coke prefers to employ a vaccine of mixed coliform organisms. The chapter on the general management and treatment of hay-fever and allied conditions is good. The book ends with an account of chronic nasal catarrh, which is far too short to deal adequately with this intricate subject. There is a good index and a copious list of references to authorities.

Cytological Technique

By JOHN R. BAKER, M.A., D.Phil., Lecturer in Cytology in the University of Oxford. London: Methuen and Co., Ltd. 1933. Pp. 131. 3*s*. 6*d*.

MUCH valuable information is here presented in small compass. Dr. Baker explains lucidly and concisely the scientific principles involved in the fixation of cells, and the embedding, staining, and mounting of tissues. The part of the manual that deals with fixation is the fullest and most deserving of attention. Theory is blended with practical information and the text enlivened with brief biographical and botanical notes. The author evidently has a special feeling for the conifers. How many people know that the general use of formaldehyde as a fixative is the outcome of F. Blum's observation in 1893 of the effects of this substance on the skin of his fingers? All who are interested in cytological technique will be rewarded by going through this little book; for those who desire more detailed information a good list of references is supplied.

L'exploration fonctionnelle de la rate

By ED. BENHAMON, Médecin des Hôpitaux d'Alger. Paris: Masson et Cie. 1933. Pp. 256. Fr.50.

THIS is a stimulating book. Dr. Benhamon has applied to the pathological spleen the methods elaborated by Barcroft and others for the study of its physiology. He claims that an analysis of reserve function by a combination of radiological and hæmatological methods is a valuable aid to diagnosis. In the normal person the injection of adrenaline intramuscularly is followed by a contraction of the spleen which can be demonstrated radiologically, and which leads to an outpouring of platelets and red cells into the peripheral blood. This, he believes, is accompanied by changes in the chemical constituents of the blood, especially cholesterol and bilirubin. There may also be a leucocytosis, but this is not constant and is probably dependent upon other factors as well as splenic contraction. On the basis of his observations he suggests that splenic disorders may be roughly divided into three groups: (1) those characterised by failure of the reserve function as shown by failure to contract; (2) those characterised by excessive hæmolysis in the spleen as shown by clinical and hæmatological signs of increased blood destruction; (3) those characterised by excessive destruction of platelets. In some conditions a complex disorder affecting two or more of the normal splenic functions may be present. Chronic splenic anæmias, he believes, may be divided into: (1) Banti's disease in which there is definite failure of the reserve function; (2) a hæmolytic type of anæmia associated with splenomegaly in which the reserve function is also disturbed; and (3) splenomegaly dependent upon thrombophlebitis of the splenic or portal veins in which the reserve function is unaffected. The anæmia in the latter he holds to be secondary to hæmorrhage and not due to excessive hæmolysis—splenectomy being therefore contraindicated. While devoting considerable space to a discussion of the reserve function of the spleen, Dr. Benhamon does not neglect the more usual clinical means of diagnosis. The physical signs, typical history, hæmatological picture, and appropriate treatment are all discussed and correlated with his own experimental observations. The ultimate acceptance of much of his work may be doubtful, but the book is of importance if only because it demonstrates yet again the value of applying physiological methods to clinical material.

Acute and Chronic Otitis Media

A Roentgenological Study. By GÖSTA RUNSTRÖM, Med. Lic. Stockholm: Acta Radiologica. Supplementum XVII. 1933. Pp. 89. Swed. Cr. 20.

THERE is some difference of opinion on the value of radiography in the diagnosis of inflammatory conditions of the ear, and on the degree of help given by this method to the clinician in estimating the severity and extent of aural disease. But all are agreed that, to obtain any useful skiagrams, it is essential that the projections—that is, the relative position of the head and the beam of rays—must be carefully chosen and constantly obtainable by some reliable device, and that the technique of exposure and developing be well defined and carefully adhered to. Dr. Runström gives here a full description of the technique he employs; the volume contains 54 stereoscopic skiagrams contained in a pocket at the end of the book, and his work must go far to dispel the doubts of the otologist and to convince him that radiography can show details of disease within the temporal bone which are of clinical value. The plates are beautifully reproduced and are accompanied by full clinical histories of the cases portrayed. A stereoscope is not provided, and one should be used to get the full value of the pictures. This is a valuable piece of work, of interest alike to the otologist and to the radiologist.

British Journal of Children's Diseases

IN Vol. XXX. (July–September) Dr. R. E. Steen contributes a paper on Cœliac Disease in which he discusses its incidence, ætiology, symptomatology, and treatment, with records of two cases.—In a paper on Lichen Urticatus or Papular Urticaria, Dr. G. W. Bray gives notes of 200 cases in children aged from a few days to 12 years, of whom 94 were males and 106 females. The majority of the cases were confined to the warmer months of the year. The diseases with which papular urticaria is most frequently mistaken according to Bray are varicella, variola, scabies, Hebra's prurigo, insect bites, sweat rashes, lichen planus, papular eczema, and papular erythema multiforme. In most cases which he has investigated two factors appear to be involved—one dietary and the other thermal. The dietary factor he divides into two groups of foods, viz.: (1) the fats, especially bacon fats, vegetable oils and fats, and cod-liver oil; and (2) common foods, such as fish, eggs, potatoes, oats, and chocolate in a small number of cases. The importance of the thermal factor is shown by the lesions generally appearing only in the warmer months, when the child is warm in bed, after a hot bath or exercise, or as a sequel to feverish complaints. Treatment consists mainly in removal of fats from the diet and preventing the child from getting overheated. Internally hydrochloric acid and pepsin are beneficial. Locally naphthol ointment (1 per cent.) with a solution of coal-tar (℥ ii) in calamine lotion (℥ viii) should be applied.—Under the title of a Rare Primary Osseous Dystrophy, Dr. P. Ellman gives the report of a boy, aged 15 years, the son of parents who were first cousins, who after an attack of measles at the age of 4 years gradually developed gross generalised bodily deformities, associated with generalised bony decalcification, and a low blood calcium, blood phosphorus, and blood phosphatase. The condition appears to have been first described by Morquio in 1929, and since then by Meyer and Brennermann, and Barrett.—Mr. Macleod Yearsley records a Case of Deafness due to Rickets. The patient was a girl, aged 4½ years, who had become deaf from rickets when 12 months old. The tympanic membranes were normal in texture, inclination, and lustre, but both exhibited the characteristic "salmon reflex" associated with otosclerosis. No response could be obtained to tests by voice, bell, tuning-fork, or whistle, so that the child was completely deaf. This is the first case of deafness due to rickets that Yearsley has seen in 25 years' experience of over 4500 cases of educational deafness, nor has he found any reference to this association in the literature.—Dr. Hildred Rockett reports a Case of Hæmolytic Streptococcal Meningitis with Recovery. The patient was a boy, aged 2½ years, who developed meningitis in the course of whooping-cough, complicated by broncho-pneumonia. On otological examination the tympanic membranes were normal. A profuse growth of hæmolytic streptococci was obtained from the turbid cerebrospinal fluid which was under slight pressure. Recovery followed intrathecal and intramuscular injection of scarlatinal antitoxin.—The issue contains authors' abstracts of the principal papers read at the recent International Pædiatric Congress. The abstracts from current literature are devoted to surgery.

THE LANCET

LONDON: SATURDAY, SEPTEMBER 16, 1933

EXCEPTIONALLY GOOD HEALTH

Sir GEORGE NEWMAN's report on the State of the Public Health, which appears this week,[1] contains the statement in a conspicuous place that "the exceptionally good health of the English people continues to be maintained." He contrasts this "coldly accurate statement" with the conclusions of a recent study of English public health and housing since 1844, in which it is stated that "the stark reality is that in 1933, for the mass of the population, Britain is a hungry Britain, badly fed, clothed and housed." There is, Sir George says, no comparison between the two periods 1844 and 1932; there is but an impressive contrast. He takes the infant mortality-rate as the most available medical index of communal well-being and finds not an incidental or exceptional figure but the latest return in a descending scale covering a generation. "Consider," he says, "the dense aggregation of the population in the 118 'large towns,' most of them industrial; reflect upon the devastating effect of the slums, in which so many hundreds of thousands of people are obliged to exist; ponder upon the abounding and expanding facilities for contracting infection by close community of contact in overcrowded homes and tenements, in cinemas, in schools, in factories, at race-meetings, in dancing rooms, or on trains and omnibuses; above all weigh the heaviness of industrial unemployment and its social dislocation with the distress of body and mind which follow in its train, and then remember that in spite of the disadvantages to which large sections of the population are thus subjected, the country as a whole has for some years enjoyed a period of physical health unsurpassed in our history." How has it come about? Sir George asks, but can find no satisfactory answer since we are too near to the event to measure it. But whilst many men have become unemployed, many women have entered industry, and probably as many people are now in work as there were on the average in the years immediately before the war; and employment outside the home is evidently conducive to health. Then again, one quarter of the whole population has been rehoused in new or reconditioned homes since the war. It may indeed not be unreasonable to believe that in the maintenance of health the various public medical services may have had an auxiliary and beneficent effect, but Sir George himself attaches most importance to the fact that the English people are learning more of the art of living. Twenty-five years of school medical service have left their mark; the physical outlook of the English people is beginning to change; they have learnt the happiness and worth of health and sound nutrition, of exercises and of rest, of games, music and dancing, of arts and crafts, of a freer life in the open air.

The effect of prolonged economic depression and widespread unemployment upon the public health has been studied at the Ministry of Health from various aspects: by examining the general death-rates for the various parts of the country, by scrutinising the reports of the medical officers of health, by a health insurance inquiry when the medical officers of the Ministry were asked to report frankly and freely without mutual discussion their individual views on the existence and prevalence in their own districts of any excessive sickness, ill health, or physical impairment. From all these sources Sir George finds no medical evidence of any general increase in physical impairment, in sickness or in mortality, as the result of economic depression or unemployment. We cannot, he says, fully assess the social results of these factors. There is inevitably a great and undetermined mass of deprivation, hardship, social ill, and anxiety. The inquiry has only dealt with the obvious end-results, viz., sickness returns and deaths. The national health is a finely poised equilibrium and we must not be too readily assured of the future. Though the medical reports contain no signs of widespread physical degeneration, there is an undercurrent of forewarning of the possibility of risk of mental instability in the adult man and prolonged under-nourishment of women and children. The overstrained mind is as susceptible to disease as the overstrained or underfed body. But although unemployment itself seems to be an unmixed evil, it must not, he suggests, be forgotten that in innumerable instances the unemployed person has more fresh air, physical rest, and freedom from industrial risks and restrictions than when employed. Over and above this we have in this country the medical machinery available for meeting exceptional circumstances.

[1] Annual Report of the Chief Medical Officer of the Ministry of Health for the Year 1932. H.M. Stationery Office. Pp. 266. 4s.

SALT ECONOMY AND SWEATING

WHEN our remote ancestors forsook the seas—in which they had existed in a state of diffusion equilibrium—for the land, they were enabled to survive only by taking with them a supply of their marine environment. This has persisted ever since, in the higher animals, in the form of the extracellular body fluids, which according to MACCALLUM[1] are probably identical in saline composition with the primæval seas from which they were originally derived. At any rate it is certain that the maintenance of an approximately constant concentration of salt in these fluids is one of the fundamental necessities of animal life. In starvation, for instance, the kidney ceases to excrete sodium chloride after the first few days, although the disintegration of the protoplasm and water of the cells continues until the fast is broken. In contrast with this highly efficient renal mechanism for the conservation of salt it is somewhat puzzling to find that the only other important channel through which salt can escape—namely, the skin—seems much less closely

[1] MacCallum, A. B.: Jour. of Physiol., 1903, xxix., 213.

guarded. Ten years ago Moss[2] found that miners working in a hot moist atmosphere lost so much salt in perspiration that slaking the thirst with ordinary water often caused unpleasant symptoms of water intoxication, analogous to those which follow the forced ingestion of large quantities of water and due, apparently, to dilution of the extracellular fluids. When the miners were persuaded to drink saline solutions instead of water, these symptoms did not occur.

On the other hand, the fact that man can exist on quite small quantities of salt in climates in which sweating is inevitable suggest that some degree of acclimatisation must be possible, and some recent work by DILL and others[3] confirms this surmise. In a cool environment the amount of salt excreted in the urine should approximate to the salt intake and, provided that the body-weight is constant, any deficit of salt in the urine can be put down to loss in sweat. Applying this principle, these investigators measured the salt output in several normal subjects in cool surroundings, and then continued their observations in a temporary laboratory in the Nevada desert. Here the salt deficit in the urine was considerable during the first few days, but afterwards steadily diminished although the extrarenal loss of water, as estimated indirectly from comparison of fluid intake and urine output, remained high.

These observations which, it is to be hoped, will be confirmed by more direct methods, are of considerable interest. The nature of the defensive mechanism concerned is uncertain. It may be that the sweat glands adapt themselves to the new environment and secrete sweat containing less salt. Alternatively it is possible that the composition of the sweat remains unchanged, but a greater amount of water is lost through the respiratory tract, as occurs in overheated animals, such as the dog. But whatever the explanation, the inference remains that in a hot dry climate some mechanism comes into play to conserve the extrarenal loss of salt. And, translating theory into practice, it seems desirable, as DILL and his colleagues suggest, that during the first few days in a tropical climate the process of acclimatisation should be assisted by increasing the salt intake and limiting physical exertion to a minimum.

THE PERSONAL FACTOR IN TUBERCULOSIS

IT is many years since an august layman on being informed that tuberculosis was a preventable disease inquired: "Why then is it not prevented?" One answer to the question, which would certainly have been appreciated by its author, has been provided by a girl unhappily smitten with the disease.

> "Supposing that's where I got the bug
> If I again were young
> I'm sure I'd do the very same thing
> And take a chance on a lung."

The quatrain is worth committing to memory, not perhaps as a tribute to the poetic muse, but because the social reformer is apt to forget that disease cannot be brought under control unless its victims, whether prospective or actual, are also controlled. It is indeed much easier to eradicate tubercle bacilli than the expression of those instincts upon which the survival of the race depends. The relative indifference to the dangers which surround us is after all less unwholesome than the exaggerated concern to avoid all appearance of evil which many health reformers evince. It has been estimated, so Dr. MYERS tells us,[1] not without the suspicion of a smile, that the abolition of kissing would decrease the tuberculosis death-rate by 50 per cent. in a period of 10 to 20 years. It is equally true that the abolition of explosives would diminish the death-rate from gunshot wounds to zero in a similar period. Unfortunately human inertia, ignorance, recklessness, and passion are still factors to be reckoned with when either a peace or a public health conference is convoked. But Dr. Myers is convinced that tuberculosis can be eradicated, and his interesting monograph, apparently intended in the main for lay reading, explains very clearly how this could be done, at any rate in a world completely recovered from trade depression, amenable to reason, and willing to submit to intradermal tuberculin tests and radiographic examinations whenever called upon to do so.

As tuberculosis affects both man and beast, both sources of infection must be dealt with. In many districts of America tuberculosis as a cattle plague has been almost abolished by a system of tuberculin tests and the slaughter of positive reactors. Dr. Myers would go further and place even household pets under veterinary supervision. The cat is not necessarily harmless in his eyes, for the cat has strolling propensities, and in her walks abroad may easily tread on ground contaminated by spittle, and returning home may be cuddled by the children with results which may completely belie the well-known nursery poem. The doctor may however be well content to leave animals to the veterinary officers who, as the author reminds us, are already well ahead of their medical colleagues in the control of tuberculosis. To prevent tuberculosis from spreading among human beings he would concentrate on three things. (1) Infection must precede disease. By means of the Mantoux test it is possible to separate the infected from the uninfected. All school-children must submit to intradermal tests and X ray examination must be made whenever a positive reaction proves that infection has already occurred. Only in this way can the subjects of the childhood types of tuberculosis be determined. The negative reactors will require retesting at appropriate intervals, for the child who is free from infection to-day may become infected to-morrow. In a community comparatively free from tuberculosis more than 50 per cent. of the children may give a negative test, but even so the number of skiagrams required will be sufficiently large to daunt less progressive races. In America however special plant has been devised with which it is possible to take a thousand paper

[2] Moss, K. N.: Proc. Roy. Soc. B., 1923, xcv., 181.
[3] Dill, D. B., Jones, B. F., Edwards, H. T., and Oberg, S. A.: Jour. Biol. Chem., 1933, c., 755.

[1] The Child and the Tuberculosis Problem. By J. Arthur Myers, Ph.D., M.D., F.A.C.P., Professor of Preventive Medicine, University of Minnesota. London: Baillière, Tindall and Cox. Pp. 230. 17s. 6d.

skiagrams on a single machine daily. Thus the scheme is by no means impossible. (2) Areal surveys will be required for the protection of young persons who have arrived at the vulnerable teens. Dr. Myers draws attention to the risks run by students who share bedrooms, by medical students clerking in tuberculosis wards, and especially by nurses. His statement that "under existing conditions the nursing care of the tuberculous is a hazardous occupation" is perhaps true for certain institutions where consumptives are confined in hospital wards. As applied to sanatorium nursing the statement is not supported by observations in this country though proof is difficult, for it is possible, as he points out, that an infection received in young adult life may be the ultimate cause of phthisis in middle or old age. Few would dispute the advisability of skin tests and chest radiograms for nurses commencing work among the tuberculous, or the need to keep them under unobtrusive but watchful supervision. (3) No scheme could provide for a similar system of tests for the adult community, but the methods employed among the young can and should be applied to the examination of contacts. Only in this way can the sources of infection be traced.

An analogy is drawn by Dr. Myers between the use of the Wassermann and tuberculin tests which seems hardly justifiable. When a positive reaction is obtained with the former immediate treatment is instituted, and no one would question its propriety. Dr. Myers argues that a positive tuberculin reaction is an equally imperative indication for treatment. But in the case of syphilis specific treatment is at our disposal and the risks of neglecting to adopt it are grave. In tuberculosis we have no such specific treatment, and many infected children exhibit no obvious symptoms of ill-health at the time of infection, and pass through life unscathed by tuberculous disease. When demonstrable disease is present sanatorium treatment should be provided. This applies not only to children who betray the symptoms of ill-health, but to those cases in which there is evidence of disease—enlarged root glands, "epituberculous" manifestations—in the chest radiograms of apparently healthy children. Few beds will be required for these, and the subjects of allergy, as revealed by the Mantoux test, need not be segregated in special institutions or receive other treatment than that required by all children—viz., adequate rest, nourishing food, decent homes.

MISSING FACTORS IN ANÆMIA

SEVEN years ago G. R. MINOT and his colleagues showed that whole liver is effective in the treatment of Addisonian pernicious anæmia. Subsequently liver was found useful in all the other megalocytic hyperchromic anæmias of gastro-intestinal origin. A brilliant series of experimental observations initiated by W. B. CASTLE suggested that this "pernicious anæmia factor" in liver is formed by the interaction of a factor present in normal gastric juice (the intrinsic factor) upon an extrinsic factor present in the food ingested. J. F. WILKINSON in this country and C. C. STURGIS and R. ISAACS in America then showed that hog's stomach is as effective as whole liver in treating Addisonian pernicious anæmia. Marmite in the meantime was found as satisfactory as liver in the treatment of tropical megalocytic anæmias and of megalocytic hyperchromic anæmia associated with idiopathic steatorrhœa; in Addisonian pernicious anæmia, on the other hand, even when given in large quantities, it has not proved uniformly valuable, though it may initiate slight improvement. Hence it appears that all megalocytic hyperchromic anæmias associated with gastro-intestinal disturbance are cured by liver, and, as far as has been tested, by stomach; but only certain of them are relieved by marmite. There seems therefore to be an essential difference between the hæmopoietic principles in liver and marmite, though their chemical properties are in some respects similar, both being thermostable and soluble in alcohol and water. It has been suggested that marmite owes its effectiveness to a rich and concentrated content of extrinsic factor, and that it is useful only so far as the stomach retains the power of secreting the intrinsic factor. It is possible, however, that it contains at least some small amount of the fully formed pernicious anæmia factor similar to that in liver.

Observations by Dr. WILKINSON and Mr. KLEIN published in our present issue indicate that the effective principle in stomach also differs from the pernicious anæmia principle in liver. Here, however, there are important chemical differences between the two hæmopoietic principles, since the liver principle is relatively thermostable, is readily extracted, and is soluble in alcohol, whereas the stomach principle is thermolabile, insoluble in alcohol, and extremely difficult to extract. Again, the principle of stomach obtained by fractionation is present in the protein precipitate, that of liver in the filtrate. WILKINSON and KLEIN have tried to analyse the nature of the effective principle in stomach, and they conclude that it is probably of the nature of an enzyme. This enzyme, to which they give the name hæmopoietin, is probably identical with CASTLE's intrinsic factor. By incubating the thermolabile hæmopoietin-containing fraction of stomach with beef muscle they find it possible to prepare a thermostable active product which has some at least of the characteristics of the pernicious anæmia factor in liver. They believe therefore that they have synthesised this factor by the interaction in vitro of intrinsic factor (or hæmopoietin) present in gastric juice and stomach upon extrinsic factor present in beef muscle. This view is supported by the fact that though it has proved extremely difficult to prepare a satisfactory stomach preparation for parenteral injection, it is quite easy to make an effective preparation of this kind from the synthesised pernicious anæmia factor. Stomach extracts, it is suggested, owe their value to their content of intrinsic factor—which reacts with the food ingested—of fully formed pernicious anæmia factor made by the interaction of hæmopoietin and gastric muscle.

ANNOTATIONS

SHOULD FIRE INQUESTS BE REVIVED?

LAST month a protracted trial ended in the conviction of a gang of fire insurance swindlers. They stocked premises with over-insured goods, lit their fires, and made their fortunes at the insurance companies' expense. So large were the sums involved that the danger to human life was almost overlooked until Mr. Justice Travers Humphreys sternly reminded the prisoners of this aspect of their criminal activities. The ease with which these audacious conspiracies were engineered must have been a painful shock to the public. We were told how a solicitor's suspicions were aroused, how he and his allies devoted months to the sole task of shadowing the suspects, analysing their bank accounts and business transactions, how thousands of one pound notes ("the currency of fraud") were traced through many hands, and how by almost superhuman patience and industry the widespread crimes were revealed to the satisfaction of a jury. Would the criminals have enjoyed so long an immunity if coroners held inquests upon outbreaks of fire? It is common knowledge that the wisdom of our ancestors originally entrusted this duty to coroners, and that in many cities the coroner continued to exercise this jurisdiction until litigation over a Manchester fire in 1860 gave the High Court the opportunity to declare that non-fatal fires were no business of the modern coroner. We know also that the City of London Fire Inquests Act of 1888 sanctioned a local survival of the old jurisdiction and that the late coroner for the City, Dr. F. J. Waldo, carried out this duty with exemplary care and with a firm belief in its service to the public, investigating sometimes as many as 150 fires in the year even though inquests were held in only a small proportion of these cases. In 1910 the Home Office Committee recommended that what was good enough for the City of London might well be made available for adoption elsewhere. After the war the London County Council asked that its coroners should be given powers of fire investigation, but disagreement on details caused Parliament to postpone attention to the proposal pending general legislation whereof nothing has since been heard.

With an admirable public spirit the principal insurance companies undertook the heavy responsibility and cost of the recent prosecutions. It is not a question of commercial interests only. Arson in crowded centres means the jeopardy of human lives. Would this risk be diminished if coroners were given back their ancient powers of fire inquiry? To this question Dr. Waldo's experience answers with a confident affirmative even if the comparative statistics of fires in London and elsewhere does not support the conclusion that the special legislation for the City has conferred any noticeable immunity from fire outbreaks. It was Dr. Waldo's practice to call accountants and fire experts to give evidence. The proceedings in his court usefully drew attention to dangerous structures, and the lack of proper fire escapes and appliances. He has lately stated that his records show 25 fire inquests held in the City in the year 1921; in no fewer than 11 of these a verdict of arson was returned. One such inquest revealed the work of an alien who was afterwards convicted and deported. In another case the coroner himself, on a prompt personal visit to the scene, discovered an empty petrol can. On this occasion Harris, one of the gang recently convicted, was closely examined, and the coroner decided to watch his future association with such matters. Later the same man's name was mentioned in connexion with another fire; but the outbreak had occurred, perhaps significantly, just outside the City boundary, and therefore was beyond its coroner's jurisdiction. The obvious difficulties of accumulating evidence for the purposes of the recent trial enable us to appreciate that ordinarily the police can take no action upon mere suspicion. A magistrate will not act until a definite case is established. On the other hand, the coroner, both by preliminary inquiry and by formal inquest, has authority to act judicially in sifting matters of suspicion. As no individuals are necessarily accused before a coroner, the scope of an inquest is untrammelled by the restrictive rules of evidence which apply elsewhere. The publicity of the coroner's court must in itself be in some measure a deterrent. Our eyes have been opened to the perils of arson; we can hardly afford to neglect any weapon which may serve to defeat the fire-raiser.

SODIUM NITRITE IN HIGH BLOOD PRESSURE

INASMUCH as the kidney function is impaired in some patients with raised blood pressure, either as a primary or secondary event, it is important to know what effect, if any, drugs used with the object of reducing pressure will have on this function. S. Weiss and L. B. Ellis[1] have noted the effect of sodium nitrite on cardiovascular and renal function in normal people, in essential hypertension with and without renal involvement, in glomerulonephritis, and in patients from whom one kidney had been removed. They first studied the symptoms produced by large doses (3 to 5 grains), and found the commonest to be headache, weakness, giddiness, and faintness, the latter verging on unconsciousness in extreme cases. However, severe symptoms were seen in only about one-sixth of the patients. The heart-rate was usually increased by a few beats per minute, but the minute volume output of blood remained practically unaffected. The reduction of blood pressure with sodium nitrite was found to be greater in the hypertensive than in the normal individuals, although when expressed as a percentage of the initial pressure the drop was about the same in both. The reduced pressure was maintained rather longer in the hypertensive patients, though even in them it did not exceed two hours. The fall involved the systolic to a much greater degree than the diastolic pressure; it averaged 35 mm. Hg in the hypertensive cases, but occasionally the reduction was very great, for example, from 240 to 80 mm., such a fall being usually though not invariably associated with pronounced symptoms. The effects of the nitrite on renal function were the same in all groups of patients. Studied with the urea-clearance test—i.e., output of urine per minute multiplied by the ratio urine-urea concentration/blood-urea concentration—this function was never found to be improved after exhibition of the drug; it was either decreased or more commonly unaffected.

The conclusion reached from the investigations that sodium nitrite lowers blood pressure by a direct action on the smooth muscle of the larger arteries was based on the unchanged cardiac output, the relative stability of the diastolic pressure, and the absence of flushing of the skin; the last two observations are arguments against a dilatation of the smaller arteries, arterioles, and capillaries. Severe symptoms

[1] Arch. Intern. Med., July, 1933, p. 105.

are explained by supposed selective action of the drug on different vascular areas, e.g., fainting in a patient in whom splanchnic arteriolar dilatation is relatively pronounced, while the cerebral blood flow is impaired from a lack of corresponding arteriolar relaxation. This selective action is attributed to physiological differences in the tissues concerned, but in diseased conditions another factor may operate to cause variable responses—namely, local vascular degeneration. In view of the inconstancy and short duration of its action, its failure to dilate arterioles, and a tendency to produce unpleasant symptoms, the authors consider sodium nitrite to be unsuitable for the treatment of high pressure cases. Moreover, since it may diminish renal function, its use in any case with damaged kidneys is held to be irrational.

REAL AND IMAGINARY CONSTIPATION

THE well-worn subject of the vagaries of the human bowel is reviewed with humour and sanity by Dr. Robert Coope.[1] Although he refuses to be frightened by the bogy of intestinal intoxication, he nevertheless recognises that, when the condition does exist, it requires treatment on medical lines, surgery being contra-indicated unless there is chronic mechanical obstruction. The task of the physician, he holds, is to prevent undigested or partially digested protein from reaching the large bowel and putrefying there. This can be done by restricting the meat intake, and by giving pancreatic juice. Growth of putrefactive bacteria is said to be discouraged by a lacto-vegetarian diet, while carbohydrate fermentation can be delayed by the giving of large amounts of lactose, and certain tough fruits such as dates may help. Drugs are less important, though calomel, an alkaline powder containing lactose, and Burney Yeo's chlorine water mixture (without quinine) are recommended. Bowel lavage is condemned as harmful. Dr. Coope's suggestions are simple and practical, and should be of service to the practitioner daily confronted with the problem of constipation, whether real or imaginary. "If I don't get my bowels open at least once a day I feel miserable," is a statement with which he is only too familiar, and he may be tempted to wonder, with Dr. Groddeck, whether this feeling of misery is not sometimes purely psychogenic. Few of us, from our nursery days, have escaped warnings of the dire results of a "blank day." It may well be that this constant propaganda causes an obsession about constipation which is a greater danger than constipation itself.

CONTROL OF TRAFFIC IN NARCOTIC DRUGS

A NEW supervisory body has been set up, under the Convention of 1931, for limiting the manufacture and regulating the distribution of narcotic drugs in addition to the League of Nations Advisory Committee on Opium and Dangerous Drugs and the Permanent Central Opium Board. The personnel consists of Sir Malcolm Delevingne (British), Mr. Herbert L. May (American), Prof. Tiffeneau (French), and Dr. H. Carrière (Swiss). It will be their duty to see that the quantity of the drugs manufactured is limited to the estimates of medical requirements supplied in advance by the several governments not later than August 1st in each year. No country will be permitted to manufacture drugs in excess of such estimates; imports and exports will be internationally controlled, and checked ex post facto by the annual statistical returns.

At the recent session of the Permanent Central Opium Board at Geneva the present situation in China was regarded as disquieting. Not only has the disturbed state of the country led to recultivation of the opium poppy, but it is notorious that for years China has been flooded with large quantities of morphine and heroin smuggled from abroad. A new and most disturbing feature, however, is the establishment of clandestine factories of the alkaloids in various parts of the country. Discoveries of illicit factories of morphine have been made in the western district of Shanghai, in Tientsin and at or near Dairen. The advisory committee in reporting to the Council of the League of Nations justly observed that "nothing but the effective control of the production and supply of raw opium will render impossible the establishment of works of this kind in districts where opium is grown or is easily available." In response to the appeal of the Chinese delegate a subcommittee has been appointed consisting of representatives of the interested powers to coöperate with China in suppressing illicit traffic and factories of narcotic drugs as well as to assist in the campaign against the use of prepared opium as contemplated in chapter iv of the Hague Opium Convention of 1912.

ARE CHILDREN'S HEART HOSPITALS JUSTIFIED?

THE doubts held by a substantial body of people whether the huge expenditure on sanatorium treatment is justified by results are now being reflected in discussions on the value of special convalescent heart hospitals for children. At the recent annual session of the American Medical Association, Dr. W. D. Stroud and his co-workers in Philadelphia brought forward observations[1] on 458 children with rheumatic heart disease cared for at the Children's Heart Hospital in Philadelphia over a period of ten years. Of these 98 are known to be dead (21·4 per cent.), while 138 are back at school and 22 are working; 20 are unable to work because of heart trouble, 22 for other reasons, and 7 are in hospital. Unfortunately, it appears from the tables that 151 of the children have not been followed up, so that the total mortality and morbidity may very well be more than is stated. It is interesting to note, however, that a comparative study in this country by Carey Coombs over a similar period also gave a mortality-rate of 21·4 per cent. In the Philadelphia group a large number of children (124) stayed in hospital less than two months; this group included many children, overwhelmed by infection, who never should have been sent from the wards of a general hospital to this special institution, and such patients were usually returned to the city hospitals within a few weeks. In the course of the discussion on these figures Dr. A. G. Young expressed disappointment that despite the care and money expended and "the best treatment we have to offer" nearly 50 per cent. of the children were either dead or helplessly disabled. It is therefore important to examine Dr. Stroud's results in detail to see what advantages these "heart hospitals" provide and what methods might be adopted to improve the results obtained. An alternative discussed by Dr. Stroud that in view of the rarity of the disease in tropical climates the money used for institutions should be devoted instead to transferring the affected children to the tropics until they are past the age of puberty may be dismissed as impracticable. The educative value of the heart hospital system on parents has been stressed, but it is surely possible to teach parents how to handle children with defective hearts through rheumatic supervisory centres, as is being done on

[1] Liverp. Medico-Chirurg. Jour., 1933, xli., 51.

[1] Jour. Amer. Med. Assoc., August 12th, p. 502.

a widespread scale in London and other cities. It has long been recognised that the production of permanent and serious damage is not due to the number of valves of the heart involved, but to the severity of the toxæmia brought about by frequent reactivations of the rheumatic process. Such reactivations seem often to follow infections of the upper respiratory tract, and the protection of the rheumatic child from these infections, especially in the late winter months, is of great moment. Removal to a special institution undoubtedly helps to secure this, but experience in this country, reported by Schlesinger and Sheldon, shows that such infection may occur even in special hospitals. The treatment of rheumatic heart disease in childhood, as was pointed out in the discussion, is still largely "supportive" rather than "aggressive" and it was suggested that certain auxiliary methods may prove of value in bringing the results of "heart hospitals" up to a higher standard. One of the speakers pinned his faith in chemotherapy, a line of treatment which requires much further investigation, while Dr. Stroud has already been making use of intravenous streptococcus vaccine preparations (with a streptococcal nucleoprotein prepared by H.F. Swift), through which it is hoped to improve the resistance of the child to further infection. To the primary question of the justification of continuing the treatment of rheumatic heart disease in the Children's Heart Hospital, Dr. Stroud and his co-workers sum up their reply under three headings. They consider that their results are as satisfactory as those in any similar group of children so far reported; the careful training of the parents is regarded as a valuable contribution in the treatment of the disease; and the transfer of rheumatic children to a tropical or semi-tropical climate does not seem practicable. There seems to be a certain lack of enthusiasm about this answer which would not, we feel, be shared by those concerned with similar institutions in this country. The justification for continuing to support such institutions at present lies largely in the need for knowledge as to whether the treatment is really worth while when viewed over a long period.

VESTIBULAR NYSTAGMUS

AN act of piety on the part of Prof. R. Claoué provides us with a readable account of vestibular nystagmus which is no less welcome because it was originally prepared by his father for the benefit of the practitioner.[1]

The brochure conveys a consistent theory in a small compass. The theory is based on an experiment of Ewald, who found that by artificially producing a current of endolymph in the external semi-circular canal of a pigeon he could produce nystagmus either to the right or the left according as the current was directed towards or away from the ampulla, where is placed the termination of the vestibular nerve with its cilia. It is to be noted that the oscillations in this form of nystagmus consist of a slow movement of vestibular origin followed by a rapid one in the opposite direction caused by a reflex reaction of the centre, and this last being more noticeable determines the direction in which the nystagmus is said to lie. Theoretically there should be three planes in which vestibular nystagmus may occur, but clinically there are only two—horizontal and rotatory. This is because the fluid in the two vertical canals has a connecting channel. Horizontal nystagmus is the commoner variety and its implications less difficult to comprehend. Along with it go vertigo and loss of equilibrium with a tendency to fall either to the right or the left. Supposing an inflammation of the right labyrinth to be present with nystagmus towards the left and vertigo, the patient sees objects apparently moving to the left as if he himself were moving to the right. To correct this sensation he turns his body to the right and tends to fall in that direction. Similarly, the direction of the fall depends on the initial position of the head. If the right labyrinth is diseased and the head is turned to the left, it becomes anterior, the nystagmus is directed forwards, and the tendency to fall will be backwards.

The effects of applying cold fluid or cold air to the ear and of the rotatory chair in producing nystagmus are explained on these lines, and the help which the varieties of this form of nystagmus may afford in the diagnosis of obscure nervous disease is indicated. Three examples are given. One is a purulent inflammation of the labyrinth, a second is an isolated cerebellar abscess, and a third a combination of these conditions. There may be little here set out which is not to be found in treatises of otology or neurology, but the neurologist as well as the practitioner will read it with profit.

[1] Le Nystagmus Vestibulaire et les Réactions de Mouvements. By R. Claoué, Professeur libre d'oto-rhino-laryngologie (Bordeaux). Paris: Norbert Malone. 1933. Pp. 64.

ATEBRIN FOR MALARIA IN MALAYA

THE study of malaria at the Naval Base, Singapore, has afforded unique opportunity during the last four years for comparison of the end-results of various lines of treatment. Surg. Lieut.-Commander Duncan, R.N., states[1] that prior to 1931 treatment consisted of giving quinine grs. 30 daily for three days and grs. 20 for seven days; the patient was then discharged to duty, but took quinine grs. 10 daily for a period of 30 days. In 1931 a modification of Sinton's alkaline treatment was introduced, and for the following year this was the routine treatment; on the whole the results were slightly better inasmuch as headache, giddiness, deafness, and vomiting were not so frequently noted; but that year the number of relapse cases amounted to one-third of the total malarial admissions to hospital. During 1932 the alarming increase in the number of malaria cases led to a revision of therapeutic measures. The alkaline treatment was abandoned and cases were given a ten days' course of quinine grs. 250 in all and then discharged to duty, each receiving grs. 15 for 30 days. At one period the list exceeded 700, and the inconvenience and expense (about £4 sterling daily) they caused was enormous. During September, 1932, nearly one month after fresh infections had been reduced to a minimum, readmissions continued to occur, some being the fifth, sixth, or seventh relapse after this treatment was given a trial. It was therefore decided to try Atebrin, and during the past 15 months over 400 cases have been treated with this drug. On the whole the observations corresponded with those of other observers. Atebrin was found to be easily administered, leaving no bitter taste in the mouth; it is therefore a convenient drug to give to children. The comparative cost of atebrin, plasmoquine, and quinine per case worked out as follows:—

Quinine.—One month's course (about grs. 450), 2*s.* 6*d.*
Atebrin.—Five days' course (grs. 22½), 1*s.* 6*d.* to 2*s.*
Plasmoquine.—Five days' course (grs. 2½), 10½*d.*

Patients under treatment with atebrin remained bright and cheerful. The proclivity to pigmentation

[1] Malayan Med. Jour., 1933, viii., 79.

varies greatly. The optimum dose is 0·1 g. (or grs. 1½) three times daily for five days, subtertian cases being given also gr. ¼ of plasmoquine three times a day. Even infants were found to tolerate atebrin well in appropriate doses. In the out-patient treatment of benign tertian malaria it appears to have been more successful than quinine. The increase of the percentage of hæmoglobin in the blood during the course of treatment is noteworthy.

In the course of more exact observations it was noted that all parasites disappeared from the peripheral blood after 0·8 g. of atebrin had been given over a period of two and a half days. In subtertian infection all asexual parasites disappeared from the peripheral blood after 1·0 g. had been administered over a period of three days. The possibility is noted that atebrin may exert some delayed action on sexual forms since these disappeared four or five days after treatment; but plasmoquine gives more certain and quicker eradication. In 93 per cent. of benign tertian cases the temperature dropped to normal within 44 hours and there was no subsequent rise. In subtertian infections the temperature dropped to normal in from 48–56 hours, but there was no difference noticeable in the temperature charts whether the case was treated with atebrin alone or in conjunction with plasmoquine. The immediate effect of the drug on enlarged spleens during treatment was satisfactory. After an interval of some months 77·4 per cent. of cases with splenic enlargement showed a marked decrease in the size of the spleen. The immediate results of atebrin treatment of malaria on a large scale under natural conditions were thus highly favourable. Its chief merit over quinine seems to be the prevention of relapses.

BISMUTH SUBNITRATE AND METHÆMOGLOBINÆMIA

THE publication of another case of methæmoglobinæmia following the administration of bismuth subnitrate adds to the evidence which led the Pharmacopœia Commission not to include this salt of bismuth in the B.P. 1932. The complication although rare is definite enough to be borne in mind. The case related [1] by Dr. H. E. Roe of Chicago was that of an infant who, when 40 days old, received 190 grains of bismuth subnitrate within a period of 48 hours for the treatment of intractable diarrhœa. Before death signs of anoxæmia developed, and at the post-mortem examination the blood showed the chocolate brown colour of methæmoglobin which was proved spectroscopically to be present. In Dr. Roe's survey of the literature is mentioned van den Bergh's demonstration that nitrites can form in the bowel from nitrates and then be absorbed. Experimental work is also quoted which indicates that methæmoglobinæmia can be produced by nitrite injections. Although due importance must be paid to these observations, it should be added that the catastrophes cited in clinical practice have occurred in patients who were debilitated or toxic, and therefore unlikely to tolerate massive doses of any potent drug. This fact is not overlooked by Dr. Roe when he mentions the contributory adverse influence of otitis media, intestinal intoxication, and hypostatic bronchopneumonia, all of which were present in his own case. It would appear then that there are circumstances in which the choice of the subnitrate may be attended by disaster, a fact which should be taken to heart by practitioners who may have used it without untoward result for a long period. Dr. Roe comments on the fact that in six pædiatric text-books, under the treatment of summer diarrhœa, the use of bismuth salts is recommended without mention of the possible dangers of subnitrate. Judging from experience already quoted [2] the danger is not recognised by some French observers.

[1] Jour. Amer. Med. Assoc., July 29th, p. 352.

A REMEDY FOR CHRONIC AMŒBIASIS

CARBARSONE belongs to the original series of organic arsenicals prepared and tested by Ehrlich and Bertheim as long ago as 1909. Its full name is 4-carbamino-phenyl-arsinic acid; it is a white crystalline solid without odour or taste, and it contains 28·85 per cent. of arsenic. It is readily absorbed after oral administration and is excreted in the urine at about the same rate as stovarsol, but, experimentally, it is less toxic and is regarded as having more powerful amœbicidal properties, being eight times as lethal as stovarsol. The drug has lately been put on the market in pulvules of 0·25 g. (grs. 3¾) each, and favourable results have been obtained with it by A. C. Reed and others in America. This has led to its trial in the wards of the Carmichael Hospital for Tropical Diseases, Calcutta.[3] The criterion of cure applied in the series of 31 cases was five or more negative examinations of the stools on different days after the cessation of all treatment; but Lieut.-Colonel Chopra and his colleagues readily acknowledge that the patients could not be considered fully cured after such a short experience. They consider, however, that the proportion of probable cures to failures in this series was 5·75 to 1, as compared with 3·5 to 1 obtained by R. Knowles in a similar series treated with emetine bismuth iodide, and 3·16 to 1 obtained by H. W. Acton and Chopra with kurchi bismuthous iodide. The drug is given by the mouth in gelatin capsules twice daily for ten days. The patients were kept on ordinary diet and, apart from saline purgatives for the relief of constipation, no other drug was given.

[2] THE LANCET, 1933, i., 1028.

[3] Chopra, R. N., Sen, B., and Sen, S.: Indian Med. Gaz., June, 1933, p. 315.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL.—From Oct. 2nd–28th an intensive post-graduate course in laryngology, rhinology, and otology will be held at this hospital. There will be classes in anatomy and physiology, operative surgery, pathology, and bacteriology, and a practical course in peroral endoscopy. The annual address will be given on Friday, Oct. 6th, at 4 P.M., by Dr. C. P. Symonds, who will speak on the clinical significance of vertigo. Further particulars of the course may be had from the secretary-superintendent of the hospital.

INTERNATIONAL CONGRESS OF HYDROLOGY.—The fourteenth meeting of the Congrès International d'Hydrologie, de Climatologie et de Géologie Médicales is to be held at Toulouse, France, from Oct. 4th to 10th, and will be followed by visits to health resorts in the Pyrenees. The meetings will take place in the faculty of medicine, where there will also be an international exhibition illustrating health resorts and methods of physical treatment. The presidents of the congress are Prof. Sabatier and Prof. Abelous, and the hon. secretaries Prof. Serr and Prof. Moog. The subjects under discussion include indications for stimulating cures for children, the hydrological treatment of certain infective conditions of the nervous system (introduced by Sir James Purves-Stewart), and the statutory control of spas and their use by the army medical services. The Ministry of Health is to be represented by Dr. Malcolm Campbell, of Droitwich, and the International Society of Medical Hydrology, which will hold a general meeting of members during the Congress, by Dr. W. G. Willoughby, medical officer of health for Eastbourne.

SPECIAL ARTICLES

BRITISH ASSOCIATION

ANNUAL MEETING AT LEICESTER

The Activity of Nerve-cells

THE presidential address in the section of physiology was given by Prof. E. D. ADRIAN, F.R.S. The aim of most physiologists, he said, is to explain the working of the body in terms of its constituent cells. The integrative action of the nervous system makes it responsible for the behaviour of the organism as a whole; in so far as his understanding of the mode of action of nerve-cells is concerned, the physiologist's attempt to explain the *actions* of the human organism is still sufficiently far from fruition for him to gain interest from the need for a similar explanation of its *thoughts* without being himself tempted to stray on to psychological or metaphysical planes. He remains concerned with defining those special properties of the cells of the nervous system—e.g., their conducting elements of great length and their multiple interconnexions—that underlie their effectiveness in providing rapid and appropriate responses on the part of the body as a whole to changes in its environment.

Experiments in tissue culture and in transplantation on amphibian larvæ have demonstrated the astonishing plasticity of the developing nervous system, both to influences from within the growing mass of nerve-cells and to those from without, that makes it able to accept an extra limb or sense-organ experimentally transplanted and to supply both more nerve-cells to govern its activity and more nerve-fibres to link it with the rest of the body. However diverse the final anatomical appearance of different neurones may be, it seems that all are originally cast in the same mould, and that their final differences in structure are the result, not so much of the innate properties of the cells themselves, but of diverse environmental influences exerted by the rest of the body in the course of their development. Associated with this singleness of their origin is the very close similarity of their activity: this is essentially rhythmic; the alternation of rest and activity, of repair and breakdown of surface, which has long been recognised in the case of peripheral nerve-fibres, has now been found to characterise the activity also of the central grey matter.

The spread of a disturbance along a nerve-fibre attached to a sense-organ that is excited by an external stimulus is an active process—i.e., it entails the liberation of energy at each "point" in succession along the nerve in a way or in a form such that the equilibrium of the adjacent "points" on the nerve are similarly disturbed. After the passage of such a wave of disturbance the resting equilibrium is everywhere restored in a very brief interval of time; the fibre is then ready to conduct another exactly similar wave of disturbance. However initiated, the waves of disturbance in a given nerve-fibre are all identical in magnitude and in rate of propagation. It is in the form of these waves of propagated disturbance that all afferent information reaches the central nervous system and that all its efferent messages leave it. The particular properties that underlie the initiation and the conduction of these waves of disturbance are highly developed in nerve-cells, but are not confined exclusively to them; thus muscle-fibres, which normally conduct similar but slower waves of disturbance, may be induced also to initiate them, but only by experimental artifices such as treatment with various salt solutions that in any case yield but a poor copy of the nervous mechanism.

The fate of the afferent impulses from the sense-organs and the genesis of the efferent impulses to the muscles, both within the central nervous system, is little understood. Its analysis in terms of spinal or of cortical reflex activity has gone far in the hands of Sherrington and of Pawlow respectively. Its analysis in terms of the electrical changes which accompany activity of the central grey matter has only just begun. At present the main difficulty lies in the interpretation of such electrical records. Whenever a group of nerve-cells is in action, in the cerebral cortex, in the brain-stem or in the retina, in a vertebrate or in an insect, these electrical variations have the same form. A series of waves of smooth contour, due to potential changes more gradual than those in the nerve-fibre, may be constantly recorded from the unanæsthetised cerebral cortex. In simpler parts of this, where most of the neurones are acting in unison, these waves may have a regular rhythm (5 to 90 or more per sec.) that rises and falls when the stimulus that elicits them changes in intensity. Therefore, in the central grey matter as in the peripheral nerve-fibre we have a reasonable picture of what is happening in a given neurone. The means by which spread of excitation takes place from one neurone to another is less well understood; that chemical as well as electrical changes play a part is suggested by the much greater influence that chemical changes have on the activity of the grey matter than on that of the nerve-fibre.

That localisation of function within the cerebral cortex is a concern of large masses and not of specific neuronic pathways, and that the reactions of the cortex cannot be explained in terms of anatomical models of groups of neurones, is shown most clearly in the analysis of habit-formation and of adaptation to injury. We learn to recognise shapes seen, and we learn to give complex motor responses, by the acquisition of "patterns" of cortical activity rather than by the lowering of specific synaptic resistances and the channeling of nervous pathways. The central nervous system of an insect will adapt itself to the loss of a limb by the complete reorganisation of its efferent motor control. The central nervous system of a mammalian vertebrate is capable of re-learning acquired habits that have been lost through experimental destruction of those parts in which these habits are normally localised. These acquired responses of the cortex can nearly all be learnt, and nearly all destroyed responses can be re-learnt, in any part of the original or of the residual cortex, respectively. It is upon the total mass of functionally active cortex and not upon its distribution that this property of learning depends. Conversely, the effects of an injury in terms of loss of responses depend upon the amount of grey matter destroyed and not upon the interruption of specific intracortical connexions.

For an understanding as to how acquired responses are stored in terms of the activity of extensive masses of the cortex and not in terms of specific neuronic pathways, we need not be forced outside the conceptions of physiology. Perhaps measurement of the actual number and combination of neurones essential to the acquisition of a given response or

analysis of the reactions of isolated parts of the cortex may forward this understanding. The production of collective rhythms of electrical discharge may be taken to indicate activity in a group of cortical neurones that are active in unison and functioning as a unit. The recording of electrical disturbances from the cerebral cortex thus supplies us, Prof. Adrian concluded, with another line of investigation; it supplies us with a fresh set of data and may give a new outlook on the working of the brain.

The Practical Value of Physiology to Industry

Dr. G. P. CROWDEN, speaking to the Department of Industrial Coöperation, pointed out that physiology has a dual field of application in industry—namely, to the worker in relation to his work and also to the products of manufacture. On the one hand, nearly 16 million men and women in England and Wales are engaged in industry, and the daily cycle of work, fatigue, and recovery must be in equilibrium if the health, comfort, and efficiency of these workers are to be maintained. On the other hand, the products of such industry, including such things as heating, lighting, ventilation, and clothing, are themselves primarily designed to supplement or aid the natural powers which the human body possesses of adapting itself to its environment. Hence both production and product require that the physiological needs of man should be studied and understood.

The various physiological factors to be considered in any single problem of work fall into four distinct though mutually reacting groups as follows:—

1. The *work factor* comprises the study of the muscular effort involved—whether heavy, moderately heavy, or light—and the performance of that effort with minimum fatigue and optimum efficiency.
2. The *environment factor* includes temperature and humidity, lighting, noise, and vibration.
3. The *time factor* offers problems concerning the optimum duration of work shifts in relation to the severity of the work and the strain of the working environment. Further, the rate of execution of the work may produce unnecessary fatigue unless it is adjusted to the physiological powers of the worker.
4. The *personal factor* differs from the other three in that it is essentially under the control of the individual worker, though the others are almost entirely under the control of the management. For example, it rests with the worker whether he makes proper use of protective clothing or respirators, whether he adopts methods of working and resting recommended, or whether the family food is bought to the best advantage. Only education, understanding, and above all goodwill between employees and employers can ensure that this factor does not discount the good which might be done by proper attention to the other three. The proper selection of operatives according to their aptitudes and physical fitness is of course essential for the best results.

In any one problem all these factors must be taken into account. It would be of little benefit to a worker if he were carefully instructed to perform a manual task, in such a way as to increase his efficiency, if the conditions of temperature and humidity of the working environment were such that the strain imposed on his body was excessively great.

Even at his best, man is only approximately 25 per cent. efficient in the mechanical sense, and this means that for every unit of useful work performed at least three times as much energy is wasted as heat, which must be got rid of from the body to its environment if the body temperature is to be kept within normal limits. It is only too easy for work to be performed at a much smaller efficiency than 25 per cent. by executing unnecessary effort or movements or working under conditions of postural strain, or even executing the necessary movements too rapidly or too slowly. By estimating the amount of oxygen used before, during, and after a task it is possible to determine the mode of execution of the work which permits the minimum expenditure of bodily energy. In heavy muscular work and also in continuous moderately heavy work this is desirable, but in light tasks the actual amount of energy expended matters little; indeed, in some occupations if more muscular effort and movement were involved the workers would in all probability benefit very considerably.

The moderately heavy continuous muscular work of carrying loads by women has been investigated by Prof. E. P. Cathcart and Miss E. M. Bedale and others at Glasgow, and it was shown that when the load was handled or distributed so that the normal erect posture was least disturbed the oxygen cost per unit of useful work done was a minimum. Further investigations showed that the maximum loads carried should not exceed 40 per cent. of the body-weight of the worker for continuous work nor be greater than 50 per cent. for intermittent carrying. The importance of avoiding postural strain, particularly in light continuous work, is not fully realised.

In the case of heavy muscular work by man an investigation was carried out on barrow work in the Fletton brick industry. It was clearly demonstrated that the actual stopping of the barrow owing to a badly arranged run between the kilns and the presses or rail sidings might involve the expenditure of 30 per cent. more energy per load by the worker. In such work the worker is getting quite enough physical exercise, and any wasteful expenditure of energy per load may amount to a great deal at the end of the working day during which he may have handled 140 barrow-loads of bricks. It was also shown that the normal brisk walking pace of the worker was more economical than either a deliberately slow walk or a forced walking pace such as is often adopted by men on piece-work when emptying the kilns of burnt bricks. Moreover, ways of loading the bricks on the barrow in accordance with the stature of the individual were studied, and a working routine devised whereby new workers could be readily advised as to the optimum arrangement of the load to suit the natural height of their hands above the ground level.

In light-speed work, such as in the boot-making industry, the actual expenditure of energy by women workers may be slight; but this does not necessarily mean that the fatigue produced will be proportionately small, for the work may entail the continuous use of the fine muscles of the hands and fingers, and may necessitate continued postural strain unless the height of the work bench or seating is properly adjusted to suit each worker. Static effort or continued muscular strain is particularly fatiguing, and I believe in Russia at the present time physical exercises are occasionally introduced during work periods in order to compensate for the harmful effects of prolonged postural strain which certain types of industrial work of necessity involve. In this country and America physical recreation and training is encouraged by many industrial concerns, and this is undoubtedly of the greatest possible value to employees whose work is manual but sedentary.

In many types of work the introduction of mechanical devices and tools operated by compressed air has profoundly changed the character of the effort on the part of the worker, though the product of his labour is the same as before.

In the case of the road-breaking pneumatic hammer or the riveting hammer, the worker's muscular effort is exerted against the mechanical tool in order to guide it and keep it in position to do its work. His actual oxygen consumption and expenditure of energy may be much less per unit of useful work done than if he used a sledge

hammer, with the use of which he did at least have the stimulus of dynamic effort and the increased circulation of blood and variety of movement entailed thereby. Postural strain and static gripping effort with pneumatic tools are increasingly replacing the former dynamic muscular work. Dr. Crowden found that under certain conditions of external cold the hands of workers tend to become unduly chilled when using vibrating tools, and it appears that if the hands are cold the blood-supply to the fingers is more likely to be affected by vibration than if they are kept warm; no doubt the cushion effect of a good blood flow through the fingers and hands damps down the vibrations and protects the delicate tissues from injury by repeated mechanical shocks.

Another subject investigated by the speaker was the effect of noise on hearing—"boiler-maker's deafness." The acuity of hearing of a number of riveters and non-riveters in H.M. Dockyard at Devonport was measured, and it was evident that riveters and holders-up after 15 years or so on the job showed distinct deafness in both ears of a degree which would amount to a serious handicap in a school-child. This condition is probably preventable if the workers will use a very simple ear-stop of cotton-wool and paraffin wax.

Many experiments have shown the importance of paying due regard to the physiological limits of vision.

In a branch of the hosiery industry, for example, eyestrain was produced by the effort of converging and focusing both eyes on fine silk threads which had of necessity to be held close up to the eyes for them to be seen at all. Suitable spectacles were tried on workers with normal sight, and it was found that not only was there a material reduction in fatigue but a considerable increase in the rate of working—namely, results mutually beneficial to both the workers and to the industry.

The temperature, humidity, and movement of the air or, speaking generally, the conditions of ventilation in a factory, workshop, or mine are also well known to exert a profound influence on the health and working capacity of the workers, particularly if the work is heavy and the physiological cooling power of the air is low. In hot and deep mines the problem of maintaining a physiologically safe working environment is a very difficult one, and physiological tests have proved useful in picking out men who showed abnormal reactions to work under such conditions, and who might develop heat stroke if sent to work in the mines without a preliminary period of less severe work. By suitably adjusting the acclimatisation period for the susceptible men it seems possible to minimise the risk of heat stroke and heat collapse. However, physiological tests alone are not enough in such extreme cases as this. If the mines are to go deeper, engineers and medical scientists must collaborate, the latter defining the physiologically permissible limits of temperature, humidity, and air movement, and the former devising ways and means of ensuring the maintenance of such conditions in the working environment.

In conclusion, to illustrate the application of physiology to manufactured products, Dr. Crowden referred to some observations on the heating of school classrooms by different methods, and also to an investigation on protection against external heat.

The Status of Psychology as an Empirical Science

Prof. F. A. P. AVELING in his presidential address to the section of psychology quoted Eddington's statement that we either know mind directly as an experiencing entity or we merely know phenomena. His own thesis was that we know both—partly from introspection and also because unless we grant the immediate awareness of the self as existing and active we cannot account for our belief in the external world. Experience is as real as sensory experience in which the physical world is revealed to us, including our own bodies. The starting-points of physical science are the sense data—but these are abstracted from experience—a selection from it. Again physical science makes use of concepts which it does not find in the world of sense. What Eddington calls "remote inferences" are only made possible by the occurrence of mental processes which are not a part of sense data. It is a characteristic of the physical sciences that they rely upon concepts and return to empirical data for verification. Psychology however accepts the whole of experience and in that sense its content is richer than that of the physical sciences and therefore actually more empirical. To begin and end with sense data alone is a philosophical prejudice. Experience includes affective and volitional events—thought-things as well as sensed-things. Yet physical science, arid and colourless, claims to deal with "reality." The experiences which the physical sciences reflect are no less essential for a complete and comprehensive picture of reality—in the Cartesian sense such experimental data as self-awareness are not merely convincing but indubitable (Cogito ergo sum!).

Prof. Aveling supports his thesis from both structural and functional analysis. On the analogy of chemistry, splitting of wholes reveals elements, but the mere addition of these elements of the mental alchemy no more reproduces wholes than addition of constituents reconstitutes the compounds of chemistry. Introspection does not merely discover elements, but relations and correlations. Particularly is this so as regards the discovery of causal relations. By functional analysis we discover the laws of occurrence—i.e., the relatedness of physiological and psychological events (Weber's law). All conclusions based upon such investigations are heavily weighted with conceptual constructions. In such processes of experience we deal not alone with sense data but with ideal and real elements and an ever-active self. Physiological events do not contain the principles of their own explanation within themselves. We have to use such terms as energy and cause to explain changes and relationships—each borrowed from psychology. The history of science demonstrates the attempt since Aristotle to explain "matter" and "form" which are through and through coloured by agency and causation. The successive modifications of the concepts of cause are efforts to de-anthropomorphise science. Thinghood and unity cannot be envisaged in the absence of the immediate awareness of ourselves as unitary, existent, and self-identical beings. "My notion of unity," said Prof. Aveling, "is derived from the same source of immediate, non-sensorial experience of myself and analogically applied to sensed-things and thought-things alike." Similarly "energy" is a concept not to be discovered among the particulars selected from sense. The self is the only real continuity that is immediately known to us. It is always at work. The "self does actualise, or energise in different ways—now perceiving, now judging, now resolving, now enjoying." The whole grandiose structure of science rests upon the concepts of relatedness and agency—concepts which cannot be derived from sense data alone but from the totality of experience which is the subject matter of psychology. Thus psychology becomes the most empirical of the sciences.

PROBLEMS OF MEDICAL PRACTICE IN AMERICA

(BY A SPECIAL CORRESPONDENT)

II *

I HAVE already pointed out that the report of the Committee on the Costs of Medical Care afforded evidence that on the ordinary methods of private practice large and steadily increasing classes of the American people are unable to pay for the medical care they need. This result is attributed in great part to the development of medical science, which has led not only to the growth of specialisation but also to the use in many cases of team-work as an essential condition of successful treatment. About 23 per cent. of the doctors in the United States limit their practice entirely to a special branch of medicine, and another 21 per cent. are partial specialists. In large urban centres specialism has developed to a greater extent than these figures indicate; in cities with 50,000 population and upwards, less than 40 per cent. of the doctors devote themselves entirely to general practice. The growth of specialisation has been accompanied by an increased reliance upon capital investment. Medical care becomes more and more dependent upon the use of a scientific equipment, involving capital expenditure beyond the resources of all but a comparatively few individual practitioners. More important still is the capital investment in hospitals; in America the hospital, which is in many cases a proprietary institution conducted on a self-supporting basis, has largely been substituted for the patient's home as the most suitable place for the diagnosis and treatment of severe illness. Medical care, then, in its economic aspects, presents two of the features of modern industrial evolution: an increase in specialisation, and in the use of capital investment to provide buildings, apparatus, and equipment. It has made less progress towards the next stage in the evolutionary process—the integration of personnel and equipment in a coördinated system for the provision of medical services.

TREND TOWARDS INTEGRATION

There is, however, a growing movement in the medical profession towards integration. The substitution of the "office" for the doctor's residence for professional purposes is a tendency in this direction. It is now only in rural areas that the American doctor, whether general practitioner or specialist, sees his patients in his own house. Elsewhere he takes a set of rooms (or "office") in the centre of retail trade for his professional work. Even in towns of about 5000 population the doctor will have his consulting-room in "Main-street," not in the residential district in which he lives. In some towns buildings have been erected exclusively for the offices of doctors or dentists. In Dallas, Texas, for example, nearly one-half of the 500 doctors practising in the city have their offices in one building. The concentration of large numbers of doctors in the business centre of the town makes for the coördination of medical services; a general practitioner can arrange for his patient to leave his consulting-room and receive in the same building an X ray or dental examination or a laboratory test. In many cities groups of doctors have combined to reduce their practice expenses by a joint utilisation of waiting-rooms, scientific equipment, and technical and clerical personnel, while retaining an individual financial relation with their patients. There is a tendency also to use public hospitals for private practice. Nearly 1000 hospitals permit the doctors on the staff to see ambulatory cases as private patients in the hospital either before or after the various clinics held in the hospital are open to the public.

Perhaps the most significant feature in medical practice in America at the present time is the association of general practitioners, specialists, and dentists to form a "private group clinic." The movement has spread considerably since the war, and there are now some 200 of these clinics, chiefly in the smaller cities of the Middle West, in which from 2000 to 2500 doctors and dentists are associated. The outstanding characteristic of this form of practice is that the incomes as well as the expenses of the practitioners are pooled. Unless consultations are required, one practitioner only treats a given case, but there is no direct financial relation between individual doctors and patients; the financial responsibility for each patient is assumed by the whole group. Many clinics exclude certain special forms of practice, such as obstetrics, pædiatrics, orthopædics, or psychiatry, but for all cases that are accepted the clinic provides a full range of facilities for diagnosis and treatment, including laboratory examinations, roentgenology, physical therapy, cardiography, and tests for basal metabolism. For major surgical operations the clinic usually relies upon a separate hospital. Patients can select a practitioner from among the members of the clinic staff, and the "family doctor" relationship between doctor and patient is encouraged. From an economic point of view the clinic practitioners may be divided into two classes: the proprietors of the clinic, who share the profits, and the practitioners employed on a salaried basis. The proportion of the two classes varies widely in different clinics. In 27 clinics specially investigated by the Committee on the Costs of Medical Care it was found that the average net income per practitioner was about $9750 (£1950). Clinic practice enables considerable economies to be made in practice expenses, which in individual practice in America are equivalent on an average to about 40 per cent. of the gross income; in clinic practice the proportion for similar items of expenditure is about 20 to 25 per cent. It appears, however, that the economies thus effected do not result in lower fees to patients. Usually the fees are the same as those charged in independent practice. Most of the clinic patients are described as persons of moderate means, some are well off, and there are a few who are very poor. The clinics are in direct competition with local practitioners, who do not therefore utilise the clinic facilities unless their field of practice is not one of those included in the clinic's range of activities.

It is claimed that in group clinic practice the patients receive better service than they would from a number of practitioners in independent practice, and that by a more economical use of capital invested in equipment, &c., and of the practitioners' time, the cost of providing medical care is reduced. But since the economies are not reflected in lower fees the clinic does not afford a direct solution of the problem defined by the secretary of the American Medical Association as that of providing "adequate scientific medical care to all people, rich and poor, at a cost that can reasonably be met by them in their respective stations in life." Indirectly, however, it affects the problem, for it provides a basis for some of the various kinds of contract practice which have

* Part I. appeared in THE LANCET last week.

sprung up in the attempt by the public to find a satisfactory solution.

CONTRACT PRACTICE UNDER LAY CONTROL

The present position of contract practice in America is in some respects similar to the position in this country, in the days when your special commissioner was describing the "Battle of the Clubs," as it was waged in the numerous centres visited by him. Increasingly, various methods are being adopted by the public to obtain medical care by periodic payments; in other words, by the adoption of the insurance principle. There is also the tendency, noted by THE LANCET commissioner in England 40 years ago, for lay organisations to exploit the profession by selling medical care as a commodity; and signs are not wanting that the profession is becoming alive to the dangers of the position, and is taking steps to protect its legitimate interests and its place in the community.

In the Western States, and especially in California, many lay organisations have recently sprung up to sell medical care for profit. The organisation issues health insurance policies and provides medical service through contracts with practitioners. The Committee on the Costs of Medical Care give particulars of a company that sells to the public at large a certificate giving the holder and his family the right to medical treatment by a practitioner appointed by the company. The premium covering the holder and his family is 25 cents (1*s.*) per week, and the method of medical remuneration is described by the proprietor of the company as follows:—

> "For every family assigned to the care of the doctor in his section, he receives 25 cents per month irrespective of whether his services are required or not. So that if we assign 400 families to a doctor he is assured of $100 (£20) a month income, for which he will probably be required to make from 50 to 60 calls, judging from the past experience we have had. Our collection cost runs about .25 per cent., which leaves 50 per cent. out of every dollar collected for overhead and profit."

It will be noted that the doctors employed by this company receive only 25 per cent. of the money collected from the patients. This form of commercialised insurance is naturally viewed with disfavour by the profession. The medical service is not infrequently obtained from the lowest bidder, and appears to be of a relatively low quality.

Another way in which commerce has intervened in the provision of medical care is by the application of the instalment system, which is popular in America, to the payment of doctors' bills. Within the last few years many proprietary organisations have been formed to purchase practitioners' accounts and collect in instalment payments the amount, or part of the amount due, or to lend money either to patients or practitioners to be repaid in instalments with added interest at a rate varying from 12 to 43 per cent.

Since the war there has been a considerable extension of the provision of medical service for persons employed by a firm or a group of firms. There is special need for such provision in the railroad, mining, and lumbering industries, in which many employees live in areas remote from ordinary medical facilities; and in these industries there are about a million employees who with their dependents receive medical care under special arrangements made by the industry. Usually industrial medical service is provided by the employer and may be on an extensive scale. The Endicott Johnson Corporation, of Binghamton, New York, a large shoe-making firm, employ a full-time professional staff of over 100 persons, including 28 doctors, 4 dentists, and 67 nurses, for the treatment of their 15,000 employees and their dependents. Sometimes the service is provided by an association of employees formed for the purpose, and the arrangements resemble those of the "poundage system," which was prevalent in South Wales before the days of compulsory health insurance. More frequently, however, industrial medical service is maintained by joint contributions of employers and employees, as in Roanoke Rapids, North Carolina, where five establishments have combined to provide a medical, nursing, and hospital service for their employees and their dependents. Each employee pays 25 cents per week as a deduction from wages, which amounts to a yearly total of $33,000, and the employers contribute a total of $56,000. The service is said to be highly efficient.

The Committee on the Costs of Medical Care find that industrial medical service has certain distinct advantages. It provides more medical care than the employees could afford to obtain from private practitioners. The doctors' incomes are larger than in private practice among persons of the same economic groups, and as their working hours are regulated they have more time for study and research. But the practitioners are under private lay control, which has in some cases been exercised with unfortunate effect on the efficiency of the service, and it is not surprising that the growth of this form of practice is viewed with apprehension by the profession.

CONTRACT PRACTICE UNDER MEDICAL CONTROL

The forms of contract practice so far described are under lay control, but recently a movement has begun for the provision of medical services on a contract system of payment by professional organisations. Many of the group clinics described above accept patients on a periodic payment basis, the usual payment being $2 (8*s.*) per month, for which an extensive range of service is provided. Generally the patients form an organised group, such as the employees in a department store, but some clinics accept individual patients on similar terms. The system is increasing in popularity and is rapidly being extended.

Within the last few years steps have been taken by several county medical societies for the provision of medical services on a contract basis. Some ten societies in Iowa and a few in other States have contracted with the local government authorities to furnish medical care to the indigent. Treatment is given by individual practitioners, and the control of the service is exercised by the society. Last year the medical society of Milwaukee county, Wisconsin, put forward a more ambitious plan, proposing the establishment under a joint medical and lay board of a "Community Medical Service" for the county, open to individual patients or groups paying a monthly subscription, varying with the income of the patient. Any member of the society could participate in the service if he wished to do so, and the patients would have free choice of doctor. It does not appear that the plan has yet been put into operation.

Thus there are two important movements to be observed in medical practice, as carried on in America at the present time: one, arising within the profession, towards the specialisation and integration of medical services; the other, arising outside the profession, towards the payment of medical costs on a contract or insurance basis. Progress in either movement has promoted progress in the other, and both have

been effective in determining the conclusions of the Committee on the Costs of Medical Care, which I propose to deal with in my final article.

MEDICINE AND THE LAW

Unqualified Opticians

IN 1917, when people in this country were anxious to distinguish friends from enemies, Parliament passed the Registration of Business Names Act. This, unlike much of the anti-alien legislation of the war-time period, was permanent law. At Leeds last week two men named Kibel and Freeman were summoned under the Act for having failed to put their names on a circular in which they canvassed for orders for spectacles and offered free advice and sight testing. The Board of Trade representative who prosecuted the two men seems to have admitted that the proceedings were really taken because unqualified persons posing as qualified opticians were a public danger. He informed the stipendiary magistrate that "the Government" were taking action to stop this loophole in the law, and that a Ministry of Health committee was even now sitting and taking evidence. Meanwhile the Registration of Business Names Act, he said, provided the only control available. The magistrate treated the matter as a merely technical offence and fined each defendant 40*s*. Before doing so he had elicited from the prosecution an assurance that the men had committed no offence by posing as qualified opticians. "It is an offence," he had remarked, "to pose as a doctor." Therefore the prosecution had observed that "the medical profession have their own rules." The observation doubtless meant that it is an offence under the Medical Act for unqualified persons to use the title or description of physician or surgeon. As reported, the observation is open to misunderstanding. There are no rules of the medical profession which prevent unqualified persons from posing as doctors. If "the Government" is really taking action to protect the public from the impositions of unqualified persons, there is a large field for its operations.

Unauthorised Hospital Collections

A youth of 17 named Myer Franco was bound over for two years and placed under probation at the Mansion House Justice Room last week on charges of obtaining charitable contributions for hospitals by false pretences. Without any authority he represented himself as a collector for the Middlesex and Metropolitan Hospitals. To these institutions he handed over small sums while keeping part of the collected money as what he called his "commission." The secretaries of both hospitals had warned him that he must give up the practice. He nevertheless continued his activities till complaints to the police caused him to be arrested while endeavouring to collect money in an office in King William-street. Alderman Sir W. Phené Neal observed that the public should be warned against unauthorised collectors of charitable contributions. There seems indeed a good case for more vigilant control. Street collections are regulated nowadays under Acts of 1903 and 1916; the enforcement of these statutes probably fails to check frequent abuse. The conduct of war charities is governed by another Act of 1916. Unauthorised house-to-house collection for hospitals is subject, of course, to the general law of false pretences; but it may not always be easy to establish by evidence the distinction between fraud and altruism.

BUDAPEST

(FROM OUR OWN CORRESPONDENT)

THE HEALTH OF BOY SCOUTS

THE fourth World Jamboree was held in Gödöllö, in the huge parks of the royal castle formerly used by the late Emperor Francis Joseph. About 25,000 scouts were camping for about three weeks and it was no easy task for the health authorities to make provision for good drinking water, bathing accommodation, fresh food, sanitary services, and facilities for laundry. A fully equipped hospital was established for emergencies, with departments for infectious diseases too, and for dentistry. Fortunately the morbidity-rate was exceedingly low, although a certain amount of enteritis had been anticipated in view of the exceedingly hot weather and drought, and of the abundance of fruit available. Gödöllö is in the centre of the fruit industry, and at the time of the camp peaches, pears, melons, apricots, and plums could be had for almost nothing (a penny bought a kilo of pears). The health inspectors supervised all the fruits brought into the camp and only fresh, wholesome fruit was allowed to be brought in. Other foods were also inspected by medical officers; each nationality had its own camp kitchen, where the cooking was done according to national customs. The camp hospital, under the able management of Dr. Szukodáthy, remained free from any epidemic; 124 in-patients were admitted, amongst these being 17 British scouts. The number of infectious cases during the fortnight was 7; of these one each came from England, Hungary, Natal, Sweden, Bulgaria, France, and Holland, the diseases being measles, chicken-pox, diphtheria, and paratyphoid fever. Owing to the energetic isolation of these cases the diseases did not spread; before leaving, all boys were medically examined and no fresh case was discovered. Of the hospital in-patients seven Hungarian and four foreign boys were retained, one amongst these a Ceylon boy suffering from diabetes, and were conveyed to a Budapest hospital, with the exception of the two infectious cases, who were not moved. The dental section of the hospital made 243 extractions and in 148 cases dental treatment was given. During the whole duration of the jamboree—16 days—ambulance service was rendered by a detachment of the Budapest Ambulance Society. They were required for first-aid service in 1390 cases. On one day 300 calls were received. One death occurred, that of a Rumanian young man of 21 who suffered from volvulus. He was operated upon immediately after the attack, but gangrene of the small intestine led to peritonitis, and he could not be saved. Lord Baden-Powell expressed warm appreciation of the excellent hospital service and the French Life Saving Society presented a silver cup to the staff of the hospital.

REWARDS TO MULTIPARÆ

Six years ago a society was founded under the patronage of Madame Horthy, the wife of the governor of Hungary, under the title St. Stephen's Day Committee of Hungarian Mothers, with the aim of honouring mothers of large families. St. Stephen's day falls on August 20th, which is celebrated with much festivity in Budapest, St. Stephen having been the first crowned king of Hungary. This year the society has awarded prizes to about 1000 mothers. In the regions lying between the Danube and the Tisza rivers, families of 15–16 children are not unusual. The first prize goes to the mother of 25 children,

and the second to one who had 20 children, 17 of them now living. From a medical point of view it is of interest that most of the mothers, particularly those of the better classes, do not show signs of physical strain. In most of these multiparæ the climacteric appears to be delayed and to cause little discomfort when it does come. Some of them bear children when over 50 and even as late as 54.

STEEL ALLOYS IN DENTAL WORK

Since the introduction of the Wippla Steel alloy for crowning teeth, it has been in common use by dental mechanics, because this alloy has proved to be a first-rate substitute for silver and gold crowns. Lately Dr. Frederick Hauptmayer, director of the hospital of the Krupp factory, Germany, launched a lawsuit against six Budapest dental technicians for infringing the patent right. At the trial Dr. Joseph Kalmár, a Budapest dental surgeon, joined the plaintiffs, arguing that he owns the patent right for the manufacture of the chrome-nickel-steel alloy for crowns. The judge seemed prepared to acknowledge the right of the plaintiffs, but the defendants' counsel argued that they should hear the leaders of the National Association of Dental Technicians and the Society of Dental Surgeons, because the right vested in this patent endangers the whole existence of the profession of dental mechanics. The judge adjourned the case and ordered the hearing as witnesses of the presidents of the societies mentioned.

CLOSURE OF MASSAGE ESTABLISHMENTS

According to reports from Bucharest the public health authorities of the Rumanian capital have issued an order which will put an end to grave abuses. It forbids the keeping of so-called massage establishments and at the same time sets out a new regulation which limits the sphere of action of masseurs. It is explained that this restriction was necessitated by the fact that massage establishments had become the haunts of secret vice. According to the regulations massage can only be practised on persons of the same sex, and only on healthy subjects, the so-called curative massage being allowed only under medical supervision. Cosmetic massage where no electrical appliances are used to send current through the body of the patients may be practised freely. The order subjects the professional masseurs to special examination and no licences to practise will be given to applicants who have been punished for any offence.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

A HOSPITAL WAITING-LIST

On Sept. 1st, 1933, the waiting-list of Edinburgh Royal Infirmary stood at 2908, which represents an increase of 139 since the last report. A waiting-list of 3000 is surely too serious for one of the largest and best conducted hospitals in Scotland. No doubt every effort is made to keep it down, but one wonders whether the reorganisation of the hospital service is being tackled with the vigour that the situation obviously demands. On the municipal side important steps have already been taken, but this only emphasises the urgency of the question. For if the new accommodation now available through the scheme of the municipality is not being used effectively to reduce the waiting-list, either the new hospitals are inadequate to the Edinburgh demand or there is some failure somewhere in the process of reorganisation. To this it is not a satisfactory reply to say that the one hospital is voluntary and the others are official. No such distinction can be accepted as a real reply to the public demand.

THE RELIEF OF POVERTY

The figures for public assistance are still disconcerting in their magnitude. The total numbers receiving relief from public assistance authorities as at July 15th, were: outdoor 273,369, and indoor 11,329, compared with outdoor 228,224, and indoor 11,905 at the same date last year. Increases have taken place with both able-bodied unemployed and the ordinary poor. At July 15th there were 112,611 able-bodied unemployed receiving outdoor relief and 578 indoor relief, as against 85,954 and 479 in 1932. For 1933 the ordinary poor relief provided for 160,758 outdoor, as against 142,270 in 1932. For the ordinary poor, however, there was a reduction from 11,427 in 1932 to 10,751 in 1933 for indoor relief.

When one reflects that these burdens have been going on for some ten years, and still show, in certain sections, material increases, the prospect for improvement is very dim. Glasgow has had to increase her rates by about 1*s.* in the £ on this account alone.

THE MILK PROBLEM

In his annual report the Aberdeen county veterinary inspector says that many farmers are keeping their best cows instead of fattening them off and selling them after a single lactation. This, he maintains, should result in the building up of better dairy herds. Further, some farmers are adopting proper and economic methods of rationing based on the milk yields. Few dairies have any special provision for sick animals, and he suggests that each dairy should have a properly fitted loose box set apart for ailing cows. Mastitis is responsible for enormous losses annually, the cows being practically rendered useless at the time when they are giving their heaviest yield. There is at present no sure method of treatment whereby an affected quarter can be brought into active use again, and the inspector urges that research should be encouraged with the object of finding a preventive and reasonably certain cure. He goes on to say that an area where tubercle-free cows can be purchased is badly needed. But such a scheme would involve some effective methods of eradication. Incidentally some dairymen are installing milking machines, and in consequence they have to install efficient boilers for the production of steam and hot water; quite a number have now up-to-date sterilising cabinets. In this report it is suggested that the use of certified milk ought to be encouraged more enthusiastically by the medical profession. There is too much confusion in the minds of the consumers over the various grades at present, and there should be only two kinds of milk: milk from tubercle-free cows and—milk.

UNITED STATES OF AMERICA

(FROM AN OCCASIONAL CORRESPONDENT)

AN EPIDEMIC OF ENCEPHALITIS

The most serious epidemic of encephalitis lethargica yet experienced in this country is at present causing alarm in St. Louis. Two epidemiologists from the United States public health service are studying the

disease on the spot and the surgeon-general has also gone to the city. From August 7th to the 24th inclusive 213 cases were reported in the metropolitan area, with 28 deaths, and the peak of the epidemic has not yet been reached. On the basis of present experience it is estimated that the case incidence will be not less than 30 per 100,000 population. Thirty per cent. of the cases have occurred among persons over 55 years of age, who comprise only 13 per cent. of the total population. The case fatality-rate has also been highest amongst this oldest age-group—30 per cent. as compared with a fatality-rate of only 3 per cent. in the age group 15–34 years. This high incidence and fatality-rate among elderly people constitutes the most significant and original epidemiological observation made in the present epidemic.

The symptomatology in the present outbreak is also somewhat unusual. The clinical picture is described as being that of a general febrile disturbance, often with gastro-intestinal symptoms in addition to the more usual evidences of cerebral involvement. Disturbances of the oculo-motor functions are said to be unusual rather than usual. In agreement with clinical findings the pathologists describe lesions at a higher level than those generally found in this disease: there is involvement of the cortex but no tendency toward special localisation in the basal ganglia or brain stem.

Drinking water appears to have been excluded as a possible cause of the disease. On account of the unusual seasonal incidence it has been recommended that the patients' rooms be screened. At the time of writing there seems to be no evidence that the essential cause or method of spread of epidemic encephalitis is any better understood than in the past.

ALUM TOXOID

Some hitherto unpublished experience with alum toxoid is printed in the bulletin of the Kentucky State board of health for August. In Worcester county, Maryland, 92 coloured, Schick-positive teachers and children were given a single dose of 1 c.cm. of precipitated toxoid. Six to seven weeks later only one of the group, a male teacher, aged 29, gave a positive reaction to the Schick test.

In Virginia 324 Schick-positive children were given one dose each of 0·5 c.cm. alum toxoid containing 12·5 units per c.cm. Six weeks later 94 per cent. of these children were found to be Schick-negative. A single dose of 1 c.cm. of the same toxoid was given to each of 255 Schick-positive children, and six weeks later 96 per cent. of these children were found to be Schick-negative.

A report from Washington county, Maryland, emphasises the absence of serious reactions. Only 2 out of 100 children receiving doses of 0·5 or 1 c.cm. of alum toxoid were absent from school on the day following the injection. In neither case was the reaction considered severe. Among the 98 who were seen in school, 2 children had considerable œdema and a rather large inflamed area at the site of injection. They did not complain of feeling ill but appeared somewhat "toxic." These were the only severe reactions. Many of the children showed "practically no indications" of having received the toxoid.

A study is being conducted at present in ten counties of the State of Kentucky.

PUBLIC HEALTH SERVICES

The Social Worker in the Mental Hospital

THE home conditions of the mentally sick are increasingly recognised as an important factor which must be reviewed in assessing the causation of a psychosis, in successful treatment, and in prognosis of the patient's future health. No prognosis is complete if the patient's antecedents are not known, and the most successful recovery is unlikely to continue if home conditions are full of acute difficulties for the previously unstable patient. The social workers attached to the mental hospital have formed an integral part of the organisation of many mental hospitals in America for some years, but the practice of appointing such workers in this country is only proceeding slowly. The work comes under three heads.

(1) There is first the case of the discharged patient. The social worker may ascertain the conditions to which he will return, the likelihood of unemployment or of suitable work, the possibility of a change of occupation if the onset of the psychosis seems in any real way connected with this. She has the opportunity of seeing how far the general principles which the psychiatrist feels should govern the patient's future life can be practised, and of interpreting these in simple homely terms to the relatives. It is possible under the Lunacy Act to aid discharged patients financially, and this proviso is made use of to some extent in order to bridge the gap between return home and restarting work. The Gloucester County and City hospital have in addition a small charity for this purpose. The social worker can make suggestions about the use of such grants. Hitherto these things have been done in a rough-and-ready way by coöperation between the hospital staff and such voluntary organisations as the Mental After-Care Association and the Central Association for Mental Welfare.

(2) Then there is work in ascertaining the patient's history before breakdown, his normal temperamental reactions, the family history. Some hospitals have issued a printed questionnaire, but the answers are seldom definite or full enough to be of great service. In America, on the other hand, these inquiry sheets may be so elaborate as to be difficult to analyse. In the Birmingham group of hospitals it has been found that a psychotic family history has been discovered in 20 per cent. more cases when the social workers have carried out the investigations than when the relatives' own written answers have been accepted. In 1932 the history of 79 out of the 188 cases admitted to the Cheshire mental hospital have been investigated by a social worker, and 342 case-histories have been reviewed by the social worker attached to the Cardiff mental hospital. For such studies to have much value they should be undertaken by one worker with a wide outlook, and access to the replies to a questionnaire. Such information can be better obtained by the social worker than by the medical officer.

(3) The third function is one which is commented upon by the commissioners of the Board of Control in their report on the Devon mental hospital. Attention is drawn to the possibility of the social worker discovering new homes where improved or recovered patients may be boarded out, and thus relieve the hospital accommodation.

Over and above these direct contacts the social worker can help indirectly by bridging the gulf between the troubled minds of the relatives and the little understood hospital régime. She becomes

liaison officer to an extent rarely possible for the physician in charge of the patient. This relationship has a further aspect. If a representative of the hospital is willing to come and visit the home the harassed relatives are less secretive with the neighbours about the family grief, and the point of the social workers' questions and the general attitude of inquiry and anxiety to help are likely to be discussed outside the home. Should this happen to any wide extent it must gradually alter the common attitude of mystery and stigma towards mental illness. The London County Council have an organised scheme for the training of social workers in connexion with mental hospitals; one worker at Cardiff had over 900 interviews during 1932, and other local authorities are moving slowly in this direction. At the Leicester City mental hospital senior members of the staff obtained reports of home conditions.

Port Sanitation

At Manchester last year Dr. E. H. Walker found sanitary defects on 357 ships and remedied them on 224. They were generally due to wear and tear, 50 of them in water-closets, and mostly on coasting not foreign-going ships. On 166 ships 654 rats were destroyed; 16 examined were all free of plague. Responsibility for rats ashore falls on the Ship Canal company, not on the authority, and here 1679 were destroyed; there is no statement as to their infection. A cadet was found with malignant scarlet fever on the morning his ship was sailing for the U.S.A., and he was taken to hospital, where he died that morning; the other cadet who slept in the same cabin with him was taken, as a contact, to a sanatorium, but did not develop the disease. For venereal disease there were treated at the Salford municipal centre 36 British, 32 foreign seamen. Of imported food 146 tons were condemned, the chief item being 88 tons of potatoes.

At Bristol Dr. R. H. Parry found sanitary defects on 361 ships, more proportionately on foreign than on British-owned; they were remedied on 355. Rats were destroyed—on ships 1069, ashore 2589; 469 were examined, none found plague-infected. A case of enlarged inguinal glands caused suspicion of plague, contradicted by later clinical developments; 5 rats caught on board that ship were found uninfected. One ship from the River Plate showed many rat indications; after a first fumigation 152 dead rats were found, and 20 after a second; of 42 examined all were uninfected. For venereal disease 195 seamen were treated at the municipal clinic. Of imported provisions 220 tons were condemned, among these 304 mutton carcasses stained a dark yellow-brown, and found to contain arsenic, its source untraced.

On the Tyne Dr. W. E. Harker notes that sanitary defects were found on 560 ships, and that all were remedied. On vessels 4473 rats were destroyed, all examined and found free from plague. No information is available about shore rats. Nor is there a report of the number of seamen seen at local venereal clinics. Of imported food 20 tons were condemned. Among the imports were "Epsom salts, 858 tons."

The Decline in Gonorrhœa

Study of the reports of the various schemes for the treatment of venereal diseases under local authorities reveals a general decline in the number of new cases of gonorrhœa coming up for treatment. Medical officers are naturally cautious about attributing such a decline to a real diminution in the disease, but Dr. B. C. Stevens considers that at Grimsby there must have been a decline in incidence, no other obvious factors having been at work. At Eastbourne the removal of the private waiting-room in connexion with the V.D. clinic is suggested by Dr. W. G. Willoughby as possibly contributing to the lessened attendances; unfortunately plans for a new clinic have had to be abandoned owing to financial stress. The value of follow-up work in persuading defaulters, particularly women, to complete treatment until cured is stressed by Dr. J. Guy in the Edinburgh reports, some 2754 visits having been made by the nurse in this connexion, and over 90 per cent. of defaulting women and children having been induced to return. It is the untreated or incompletely treated woman who is chiefly responsible for the spread of gonorrhœa, and Dr. T. Pierson naturally regards the rising proportion of women to men attending in Plymouth (from 1 to 5 to 1 to 2) as very satisfactory. On the whole, the decline is most marked in the towns; some county districts, e.g., Wilts (Dr. C. E. Tangye), showed an increased gonorrhœal attendance. Dr. T. Gibson reports a comparatively large increase (chiefly in women) in attendances at the new clinic in Wakefield, but he gives good reasons for not regarding it as a true rise in incidence. Any signs, however slight, of a diminution in this disease are worthy of rejoicing, for the more we learn about the pathology of gonococcal infections the more seriously have we come to regard them.

The Format of Reports

Tastes differ, and a selection of M.O.H. reports might form as worthy an object for the collector as, say, one of British lepidoptera. The thrill of capturing an undamaged specimen of the rare Surbiton brimstone; the large clouded yellow of the borough of Hackney; the innumerable different varieties of chalk blue; the meadow brown of Adwick-le-Street, or the peculiar rarity of the plain cabbage white of Thedwastre and Stowmarket might well attract the interest of the connoisseur. In size, colour, binding, and type they range the whole gamut of the printing world, and a good case could be made out for some uniformity, at least in dimensions. Printing is almost without exception in local hands, and it might perhaps increase the cost too much to insist on a rigid conformity, but the medical librarian or collator of such reports would be grateful for a standardised index if for nothing else.

Tuberculosis Reports

THE CHANGED OUTLOOK.—Among the dry but essential tables and statistical returns will flash out now and then an aphoristic gem. In the fourteenth annual report to the Fife and Kinross Joint Sanatorium Board, Dr. William T. Munro, medical superintendent of the Glenlomond Sanatorium, speaks of the changed outlook in regard to pulmonary tuberculosis, as compared with even a decade or so ago. The aim is to get back to the beginnings of disease, i.e., by going to the child who has been infected in a tuberculous family, but who as yet shows no sign of actual disease. Greater efforts must be made to prevent such infection from developing visceral disease later on. The glandular system of such children should receive more attention at the tuberculosis dispensaries, and the observation should be continuous. Modern institutional treatment should aim more and more at overcoming the mechanical factors which interfere with the natural healing of a tuberculous lung. As a means to this

and artificial pneumothorax and its allied measures should be more frequently employed.

ACCESS TO THE DISPENSARY.—Some uncertainty exists as to how patients are received at the tuberculosis dispensaries. Is it open to the man-in-the-street who thinks he may have got consumption to walk in without let or hindrance and ask to be examined, or must he present a doctor's card on admission? There is a good table in Dr. W. D. Carruthers's annual report to the Staffordshire, Wolverhampton, and Dudley Joint Committee for Tuberculosis, which shows exactly how patients are sent to the dispensaries in these areas. Thus out of 2698 patients examined at the various dispensaries for the first time in 1932, no less than 1751 (or 64·8 per cent.) were sent by medical practitioners; 263 by the school medical inspectors; and 183 by the health visitors. The remaining 501 (or 18·5 per cent.) are included in a column under the heading "Otherwise," by which it may be inferred that these particular patients came upon the recommendation of fellow-sufferers, friends, or may even have walked in from the street. Seeing that the main object of the dispensary is to prevent tuberculosis among the community, access thereto for the purposes of medical examination should not be made too difficult, though it is preferable that patients should be sent in the first place through their own doctor.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 2ND, 1933

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 4 (last week 8); scarlet fever, 1977; diphtheria, 811; enteric fever, 53; acute pneumonia (primary or influenzal), 389; puerperal fever, 40; puerperal pyrexia, 129; cerebro-spinal fever, 17; acute polio-myelitis, 35; acute polio-encephalitis, 2; encephalitis lethargica, 6; dysentery, 13; ophthalmia neonatorum, 82. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Sept. 5th–6th was as follows: Small-pox, 15 under treatment, 0 under observation (last week 20 and 0 respectively); scarlet fever, 1640; diphtheria, 1475; enteric fever, 12; measles, 455; whooping-cough, 292; puerperal fever, 22 mothers (plus 12 babies); encephalitis lethargica, 254; poliomyelitis, 2; "other diseases," 177. At St. Margaret's Hospital there were 17 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In 118 great towns, including London, there was no death from small-pox or enteric fever, 11 (4) from measles, 7 (2) from scarlet fever, 14 (3) from whooping-cough, 20 (4) from diphtheria, 105 (19) from diarrhœa and enteritis under two years, and 15 (3) from influenza. The figures in parentheses are those for London itself.

Of the deaths from diarrhœa outside London, 22 were reported from Liverpool, 7 from Leeds, 6 from Hull, 5 each from Sunderland and Leicester, 4 from Birmingham, 3 each from Tynemouth and Nottingham. Measles was fatal in 4 cases at Liverpool. Two deaths from diphtheria were reported from Barnsley, Leeds, Manchester, and West Hartlepool.

The number of stillbirths notified during the week was 261 (corresponding to a rate of 41 per 1000 total births), including 47 in London.

UNIVERSITY OF BRISTOL.—On Friday, Sept. 29th, Sir Hilton Young, Minister of Health, will inaugurate the department of preventive medicine of this university. The ceremony will take place in the Canynge Hall at 12 noon.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Lt.-Comdrs. M. B. Devane, P. J. A. The O'Rourke, W. Flynn, R. R. Baker, E. V. Barnes, R. L. G. Proctor, W. A. Hopkins, and C. B. Nicholson to *President* for course; G. S. Rutherford to *Victory* for R.N.B., Portsmouth; and M. A. Graham-Yooll to *Bideford*.

Surg. Lts. A. N. Forsyth to *Endeavour*, on recommg.; S. K. Foster to *Pembroke* for R.M. Infirmary, Deal; W. Greaves to *Harebell*; E. L. Littler to *Pembroke* for R.N.B., Chatham, and to *Weston*; H. O'Connor to *Ormonde*; D. D. Steel-Perkins to *Vernon*; and P. N. Walker-Taylor to *Dorsetshire* (on relief).

The courses for promotion to Surgeon-Commander, R.N., have been resumed.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdrs. A. E. Christie to *Fermoy*, and H. Parry-Price to *Sutton*.

Surg. Lt.-Comdr. (D). E. D. Collins to *Rodney*.

Surg. Lts. H. A. Lockhart and R. H. Enoch to *Victory* for Haslar Hospital; S. B. Levy to *Iron Duke*; D. W. Bawtree to *Valiant*; D. M. Craig to *Excellent*; and R. D. Bradshaw to *Victory* for R.N.B.

Proby. Surg. Lt. (D) A. B. Bateman to *Vivid* for R.N.B., Devonport.

ARMY MEDICAL SERVICES

The War Office announces that Brevet-Colonel F. D. G. Howell, D.S.O., M.C., Honorary Surgeon to the King, has been appointed (temporarily) Deputy Director-General, Army Medical Services, with effect from Sept. 16th, in succession to Major-General W. R. Blackwell, C.B., C.M.G., Honorary Surgeon to the King. Brevet-Colonel J. W. L. Scott, D.S.O., has been appointed Assistant Director-General, Army Medical Services, in succession to Brevet-Colonel Howell, and will take up the appointment about the end of September.

TERRITORIAL ARMY RESERVE OF OFFICERS

Lt.-Col. G. Mackie, having attained the age limit, retires and retains his rank, with permission to wear the prescribed uniform.

Capt. J. C. Graham, from Active List, to be Capt.

ROYAL ARMY MEDICAL CORPS

Capt. J. A. Chapel retires, receiving a gratuity.

TERRITORIAL ARMY

G. E. O'Riordan to be Lt.

ROYAL AIR FORCE

Dental Branch.—Flight-Lt. J. Twohill is transferred from Class D(ii) to Class D(i).

INDIAN MEDICAL SERVICE

Majs. to be Lt.-Cols.: G. H. Mahony, G. Covell, W. R. Stewart, H. Chand, V. Mahadevan, A. C. L. O'S. Bilderbeck, J. W. Vanreenan, M. Das, J. M. R. Hennessy, H. H. Brown, C. H. N. Baker, and K. R. Rao.

ROYAL ARMY MEDICAL COLLEGE

Col. N. Low, on promotion, has relinquished his appt. as professor at the College, and Lt.-Col. and Bt.-Col. G. S. Wallace has been appointed a professor.

COLONIAL SERVICES

Dr. G. Robinson has been promoted to Senior Pathologist to the Medical Research Institute, Gold Coast.

FIRE AT A TUBERCULOSIS COLONY.—Fire broke out last week at the East Lancashire Tuberculosis Colony for ex-Service men at Barrowmore Hall, near Chester. It is said to have originated in the buildings in which fire-lighters for sale are produced in large numbers, and much damage was done.

CORRESPONDENCE

EUGENICS IN GERMANY

To the Editor of THE LANCET

SIR,—The German Sterilisation Act, of which the translation published in your issue of Sept. 2nd is the first to appear in this country, hos apparently been subjected to some misinterpretation in the press comments which followed its announcement at the end of July. In many of these comments, attention has been focused upon the fact that the Act makes it possible for a director of a German punitive institution to take the initiative in recommending the compulsory sterilisation of an inmate. Since German prisons and concentration camps, which are presumably included in the term "punitive institution," contain large numbers of political offenders, it has not unnaturally been remarked that the Act might be held to legalise the sterilisation of persons who disagreed with the policy of Herr Hitler. Careful scrutiny of the Act, however, makes it doubtful if this interpretation is justified. Clause 2 of the Act runs as follows:—

> "Hereditarily ailing in the sense of this law is anyone who suffers from one of the following diseases: (1) congenital feeble-mindedness, (2) schizophrenia, (3) periodic (manic-depressive) insanity, (4) inherited epilepsy, (5) inherited St. Vitus's dance (Huntington's chorea), (6) inherited blindness, (7) inherited deafness, (8) severe inherited physical malformation. Further, anyone suffering from severe alcoholism may be sterilised."

It will be noted that crime is not included in this list. If, therefore, the sense of the Act is governed by this clause, it would seem to follow that the directors of prisons would only be justified in recommending the sterilisation of inmates provided that they exhibited one of the nine conditions specified above. The essential point would appear to be the interpretation of the phrase "hereditarily ailing in the sense of this law is anyone who suffers from . . ." Does this mean "hereditarily ailing in the sense of this law are *only* those persons who suffer from . . ." or does it mean "persons suffering from one of the following diseases may, *among others*, be regarded as hereditarily ailing"? If the phrase is to be interpreted in the first sense, it would be impossible to sterilise a hæmophiliac or a male suffering from polycystic disease of the kidney or hereditary diabetes, or, of course, a criminal; if in the second, these and presumably other groups also might be sterilised. The following suggestion has also been made though, to my knowledge, it has not yet appeared in print. The term "feeble-mindedness" as used in this country has been given a legal definition in the Mental Deficiency Acts, and is strictly applicable only to persons of a relatively pronounced degree of mental deficiency. The corresponding term in German has a much wider connotation and embraces many categories of persons who, in this country, could not be certified as feeble-minded, but would be regarded as "retarded normals." It is not impossible that by Nazi fanatics, persons who do not share their political views might be regarded as feeble-minded in the wide German sense.

Considering the matter impartially, it is, in my opinion, improbable that the German Act was intended by those who drafted it to sanction the sterilisation of criminals, and I have been informed from an unofficial source in Germany that this is the case. But the wording of the Act is slightly ambiguous and the above interpretation is not wholly certain.

It is also worth pointing out that the German Act differs conspicuously from the Bill introduced by Major Church in the House of Commons on July 21st, 1931, and from what English eugenists think desirable or practicable. The English Bill was at pains to make compulsion impossible and included numerous safeguards absent in the German Act—among others, the consent of the spouse or, if the candidate for sterilisation were unmarried, his parent or guardian. It is important that this should be generally realised, since there is a danger of the general public being led to suppose that Nazi eugenics is the only kind of eugenics.—I am, Sir, yours faithfully,

London, W., Sept. 7th, 1933. C. P. BLACKER.

DENTAL SURGEONS IN THE MEDICAL DIRECTORY

To the Editor of THE LANCET

SIR,—For nine years the Medical Directory has not contained any list of dental surgeons. The discontinuance of this most useful section has deprived both groups of practitioners, perhaps more particularly the doctors, of a readily available and dependable book of reference, and consequently has diminished its value. In these days of increasing coöperation and contact between all branches of our profession it is frequently necessary for doctors, and others, to possess, or have accessible, a reliable record such as the Medical Directory provides. Neither the Medical Register nor the Dentists Register fufills the requirements, while the lack of a combined medical and dental directory is often a hindrance and an inconvenience to doctors in their work.

Possibly the inclusion of the names of dental surgeons was relinquished on account of expense, of the increasing size of the volume, and for other reasons, but even these obstacles are not insuperable. Although the Medical Directory is a private publication, yet by its deserved success it has gained a well-earned and unique place in the esteem of our profession and outside. In consequence a responsibility has devolved upon the owners, of which they may well be proud, both to the profession and to the public at large. It is the hope of some of us that the publishers may favourably consider the subject of this letter and furnish us once again with a medical and dental directory in one volume.

I am, Sir, yours faithfully,

Wimpole-street, W., Sept. 11th, 1933. JOHN FAWCETT.

UNEMPLOYED MEN IN CAMP

To the Editor of THE LANCET

SIR,—The organisers of Grith Fyrd Camps are most grateful for the very appreciative account of their work which appeared in THE LANCET of last week. It may interest your readers to know that the approach has been throughout biological rather than mechanistic. Instead of evolving a scheme and fitting men into it, five of the originators themselves went into camp and made the first rough shelters; they were joined after ten days by the first recruits, and the social organism thus planted has slowly grown to a group of close on fifty. The activities of the men are the natural reactions to the environment of what is in effect a pioneers' camp, and were only prearranged in so far as it was foreseen that men of good capacity—even though they might have spent all their lives in towns—would rise as they have done

to the calls made upon them by a primitive environment in which their comfort depends mainly upon their own efforts. No one who visits the camp at Godshill can fail to be impressed by the physical and mental fitness of the men; and their ideas of relative values are found to move gradually from terms of money to terms of usefulness for the practical purposes of a healthy life.

The movement began under the name of "the F.E.B. Scheme," and on March 5th, 1932, you printed a letter from the medical members of its originating group. May I add also that the transitional payment usually assessed at Godshill has now most fortunately been raised to 12*s*. The most urgent need, in addition to money and live men, is land for further camp sites—either as a gift or buyable in lots of 20 to 40 acres at a very low price.

I am, Sir, yours faithfully,

J. NORMAN GLAISTER,
Sept. 11th, 1933. Hon. Sec., Grith Fyrd Camps.

PANEL AND CONTRACT PRACTICE

Dropping Out of Benefit

As the end of the year approaches the problem of medical benefit for insured persons who then drop out of benefit is coming home to insurance committees and public assistance authorities. Various suggestions have been put forward. These persons have been unemployed so long that they are obviously unable to pay a doctor for private attendance, and some form of contract practice will be needed, preferably one which provides for the continued services of the doctor who was chosen under the Act. If he again becomes an insured person through taking up employment he would not then have to change his doctor again. If nothing is done for them the majority must drift into the hands of public assistance committees, who will provide the services of their district medical officers, free of charge, if and when required. These officers, often themselves insurance practitioners, will thus have on their hands a number of patients who really belong to other practitioners. Their position will be unsatisfactory. Unemployed persons on the list of Dr. A, who lose benefit in December next, may be obliged to obtain the services of Dr. D, acting as district medical officer; when they return to work they will go on Dr. D's list to avoid the trouble of repeated change. This difficulty might be overcome by not permitting district medical officers to undertake insurance work under the Act, or, better still, by opening the work of these officers to any insurance practitioner who wishes to do it. Any registered medical practitioner would then be able to join the panel of the public assistance authority just as he does the insurance panel. A scheme has been worked out by the clerk to the Reading insurance committee which embodies this idea, and is being considered by the public assistance authority. The insured person about to lose medical benefit would be informed that it might be possible to provide him with medical attention by his own doctor if the form supplied is filled up and returned. The form would be checked by the insurance committee and passed to the public assistance committee for examination and decision. If benefit is authorised the patient would receive a special medical card with his doctor's name on it. Drugs and appliances would be ordered on special prescription forms and payment made at capitation rates by the insurance committee from money received from the public assistance committee. The officers of this committee would review each case periodically to make certain there had been no re-entry into insurance. The Reading insurance committee have offered to run this scheme for 12 months without charge; they have the available machinery, and it would be an economy to the town to use it. The scheme seems to have received the approval of the local profession. The decision of the Reading public assistance committee and of the Ministry of Health will be awaited with interest.

"Commercially Minded" or Shackled by Regulations

"Candid Friend" writes: Your contributor returns to the case of the doctor against whom an insured patient brought an unjustified complaint, and is at pains to prove that the complaint was, in fact, unjustified. This was unnecessary. It is common ground that it was unjustified, since it was found to be so by the committee. Everyone will agree also that an unjustified complaint should not be made, either under the insurance regulations or in any other way. But how is it possible to determine whether a complaint is unjustified unless it is investigated? It might conceivably be argued that insured persons should be deprived of the right to have their complaints investigated, but this would leave them with no redress in a case of real neglect, and can hardly be what your contributor would desire. As a matter of fact, the number of complaints investigated by the medical service subcommittees is small, considering that there are nearly 16,000,000 insured persons in England and Wales, and nearly 16,000 panel doctors. According to the annual report of the chief medical officer of the Ministry of Health for the year 1931, the number so investigated in that year was 246, including complaints made by approved societies, and in 73 cases remuneration was withheld from the doctor concerned. In the remaining 173 cases, therefore, either the doctor was exonerated or it was decided that his error was not sufficiently serious to warrant the withholding of remuneration. "It will be seen," he concludes, "that the chances that any particular doctor would have an unjustified charge brought against him were remote."

[True. But when, as shown by "Candid Friend's" figures, the complaint is found to be unjustified, the doctor has no redress against the complainant. He has had to attend the investigation, has been through a very trying ordeal, has been subjected to questioning by persons ignorant of medical procedure, and at the conclusion his only recompense is that he may, if he claims it, be allowed his travelling expenses and a subsistence allowance. In private practice patients hesitate to allege professional neglect or incompetence against a doctor because of the risk of damages being awarded if their statements are untrue; but no one has ever heard of an insured person having to pay one penny for bringing an unjustified complaint against an insurance doctor before the medical service subcommittee.]

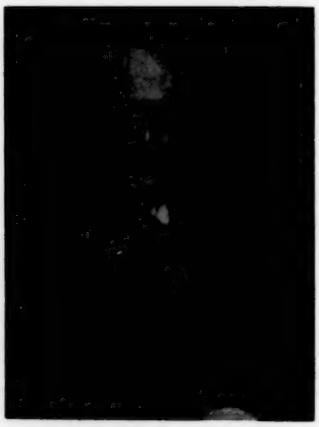
NEW HOSPITAL AT BALLYMONEY.—The Duchess of Abercorn recently presided at the opening ceremony of the Robinson Cottage Hospital which has been built and equipped by Mr. Samuel Robinson, of Philadelphia, a native of Ballymoney, Co. Antrim, in memory of his father and mother, at a cost of £50,000. He has also provided a partial endowment. The hospital will accommodate 25 patients.

OBITUARY

JOHN PLAYFAIR, M.D., F.R.C.S. Edin.

EX-PRESIDENT OF THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

Dr. John Playfair, who died at Colinton on Sept. 4th at the age of 84, was probably the oldest practising member of the medical profession in Edinburgh. One of the seven sons of Charles Playfair, of Islabank, Coupar-Angus, he graduated at Edinburgh University in 1872 and then studied in Paris and Vienna. Returning to practice in Edinburgh, he was at first medical officer to the New Town dispensary and then began to pay the special interest to the ailments of children that secured his election to the staff of the Royal Hospital for Sick Children, and his appointment as clinical lecturer on diseases of children in the University. Appropriately enough he was at this time next door neighbour to Dr. John Brown, the author of "Rab and His Friends." In 1876 he was elected a Fellow of the Royal College of Physicians, and in 1904 he succeeded T. S. Houston as president. At the quater-centenary of the Royal College of Surgeons in 1895 he was made an honorary Fellow of that College. Playfair's other main interest lay in insurance work. In 1885 he became chief medical officer to the Century Insurance Company of Edinburgh, a company which was the originator of the permanent type of sickness and accident insurance as opposed to the year-to-year contract. With this type of special insurance he was associated until his death. On the amalgamation of the Century with the Friends Provident Institution in 1918 he was appointed their chief medical officer for Scotland. He was also chief medical officer to the North British and Mercantile Insurance Company in Edinburgh for about 50 years. His opinion on insurance matters was highly valued and he retained his critical acumen in old age. Playfair had an extensive and rather select private practice, which he built up by sheer good character and constancy. He was a gracious and considerate practitioner, unflustered in manner, wise and comprehensive in making a diagnosis. He was strict in prescription of diets and food habits, particularly in cardiac cases, and the results were gratifying. It is said that he was able to carry on his work until within a month of his death.



DR. PLAYFAIR

[*Photo E. D. Young*

Dr. Playfair's country upbringing was evident in his life-long interest in country sports such as shooting and fishing. He was brought up with horses and greatly regretted the passing of the carriage and pair. He leaves a widow, two daughters, and two sons, one of whom is chief staff officer to the Royal Air Force in India. He will be much missed in Edinburgh, for he was of the quiet order of men who make friends without effort.

MEDICAL NEWS

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting held on Sept. 4th Dr. Mohammad Salamat Ullah and Dr. Maha Nand Sardana were admitted Fellows of Faculty.

St. Bartholomew's Hospital

The annual dinner for old students of this hospital will be held on Monday, Oct. 2nd, at 7 for 7.30 P.M., in the great hall of the hospital. Lord Horder will be in the chair.

St. Mary's Hospital

A post-graduate course open to all medical practitioners will be held in this hospital from Friday, Sept. 29th, to Sunday, Oct. 1st. The annual dinner for past and present students will take place at the Trocadero Restaurant, Shaftesbury-avenue, London, W., on Saturday, Sept. 30th, at 7.30 P.M.

London Hospital

A post-graduate course for old students of this hospital will be held from Oct. 11th to 14th. The annual dinner will take place at the Trocadero Restaurant, London, W., on Thursday, Oct. 12th, at 7.30 for 8 P.M., when the chair will be taken by Dr. P. N. Panton, director of the Hale clinical laboratory.

St. George's Hospital

A post-graduate course for old students has been arranged by this hospital, and will be held from midday on Friday, Sept. 29th, till midday on Monday, Oct. 2nd. The inaugural address and prize-giving will take place at 3 P.M. on Oct. 2nd in the board room, when an address on Fashion in Medicine will be given by Dr. James Collier. The annual dinner will be held on the same evening at 7.15 for 7.45 P.M., when Dr. Henry Robinson will be in the chair. The secretaries for the dinner are Mr. B. H. Burns and Dr. G. W. Mitchell.

Middlesex Hospital Medical School

The annual prize distribution of this school will take place on Tuesday, Oct. 3rd, at 3 P.M., at the Queen's Hall, Langham-place, London, W. The introductory address will be given by Prof. E. C. Dodds, director of the Courtauld Institute of Biochemistry, who will speak on diet, exercise, and weight. The prizes will be presented by Sir Holburt Waring, president of the Royal College of Surgeons of England. The annual dinner will be held the same evening at the Savoy Hotel (Embankment entrance), London, W.C., at 7.30 P.M.

William Mackenzie Medal

The William Mackenzie medal will this year be awarded to Prof. Jules Gonin, of Lausanne, in recognition of his valuable contributions to ophthalmology, especially those bearing on the treatment of detachment of the retina. The presentation will be made in the hall of the Royal Faculty of Physicians and Surgeons, Glasgow, on Friday, Oct. 13th, at 8.30 P.M., when Prof. Gonin will deliver the William Mackenzie memorial lecture on the evolution of ideas concerning retinal detachment within the last five years.

London School of Hygiene and Tropical Medicine

The nine months' course of study for the diploma in public health begins at this school on Oct. 2nd. The Fishmongers' Company studentship, entitling the holder to free tuition for the whole course, is open for competition among European students who hold a medical qualification registrable with the General Medical Council. The subject of the examination, which will be held at the school on Sept. 20th–21st, is hygiene, within the scope of the London third M.B. Applications must be received by the secretary of the school (Keppel-street, W.C. 1) by Sept. 16th.

Eugenics Society

After Sept. 25th the address of this society will be 69, Eccleston-square, London, S.W. 1.

Salaries at Bradford

The finance and general purposes committee of the Bradford city council have approved the recommendations of the health committee increasing the salaries of 12 medical officers. The total amount of the increases is £690. The committee also decided to reconsider their decision not to approve the recommendations of the health committee that, as from April 1st, 1933, the salaries of medical officers shall be fixed in accordance with the scale of the British Medical Association, less 10 per cent. temporary reduction.

London Hospital Memorial to Lord Knutsford

At the quarterly court of governors of the London Hospital last week it was stated that Sir Edwin Lutyens has, as a labour of love, designed a commemorative tablet to the late Lord Knutsford, to be placed in the main entrance hall. The inscription is as follows :—

SYDNEY GEORGE, Second Viscount KNUTSFORD.
Chairman of this Hospital from 1896 to 1931.

Friend of all manner of men he will be remembered for his generous compassion for the sick and distressed. To these he gave the best of his powers. Rich beyond most men in the gifts of energy, courage and humour, he drew others to give with a sympathy and generosity akin to his own. Through him the Hospital was largely rebuilt and equipped to serve generations yet to come. Above all he inspired it in every part with his own spirit of love and service. He died in the hospital on July 27th, 1931, aged 76 years.

"Fulfil ye my going that ye be likeminded having the same love, being of one accord, of one mind."

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Sept. 18th, to SATURDAY, Sept. 23rd.—BETHLEM ROYAL HOSPITAL, Monk's Orchard, Eden Park, Beckenham. Course in Psychological Medicine, Tues. and Frid., 11 A.M.—WESTMINSTER HOSPITAL, S.W. Course in Medicine and Surgery (for men graduates only). All day.—Individual clinics in almost all branches of medicine and surgery are available daily by special arrangement with the Fellowship of Medicine.

Appointments

PEACOCK, J. ROYDON, B.Chir. Camb., F.R.C.S. Eng., has been appointed Assistant Surgeon, Throat, Nose and Ear Hospital, Golden-square.

PETERKIN, G. A. GRANT, M.B., B.Ch. Edin., Asst. Physician to the Skin Department, Royal Infirmary, Edinburgh.

QUINLAN, J. M., M.B., Ch.B. N.U.I., Certifying Surgeon under the Factory and Workshop Acts for the Southport District, Lancaster.

ROSS, J. COSBIE, Ch.M. Liverp., F.R.C.S. Eng., Honorary Asst. Surgeon to the Liverpool Royal Infirmary.

WILSON, J. G., M.D., B.S. Lond., M.R.C.P. Lond., D.P.H., M.O.H. for Cardiff.

Vacancies

For further information refer to the advertisement columns

Altrincham General Hospital.—Jun. H.S. At rate of £120.
Bath, Royal United Hospital.—Sen. H.S. At rate of £175.
Birmingham, St Chad's Hospital.—Res. M.O. £100.
Cancer Hospital, Fulham-road, S.W.—Asst. Radiologist. £350.
Cardiff Royal Infirmary.—Res. Reg. £100. H.P.'s and H.S.'s. Each at rate of £50. Also Cas. Surg. O. At rate of £75.
Dunedin, New Zealand, Otago Hospital Board.—Sen. Res. M.O. £500.
Edinburgh Hospital for Crippled Children, Fairmilehead.—Res. Surg. O. £350.
Evelina Hospital for Sick Children, Southwark, S.E.—H.P. At rate of £120.
Hospital for Sick Children, Great Ormond-street, W.C.—H.P. and H.S. Each at rate of £100.
India, Bengal and North Western Railway.—M.O. Rs.750.
Infants Hospital, Vincent-square, Westminster, S.W.—H.P. £75.
Isleworth, West Middlesex County Hospital.—Part-time Visiting Pathologist. 3 gns. per session.
Lancaster, County Mental Hospital.—Asst. M.O. £500.
Leeds City.—Asst. M.O.H. for Maternity and Child Welfare. £500.
Leeds, Killingbeck Sanatorium.—Asst. Res. M.O. £250.
Liverpool Royal Babies Hospital, Woolton.—Res. M.O. £90.
London Jewish Hospital, Stepney Green, E.—Hon. Asst. Surgeon.
London Lock Hospital, Dean-street, Soho.—Surg. Reg. £100.
Manchester, Ancoats Hospital.—Res. M.O. and H.S. At rate of £150 and £100 respectively.
Middlesex County Council.—Two Res. Asst. M.O.'s. £400.
Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Hon. Asst. Gynæcologist.
National Hospital, Queen-square, W.C.—Asst. Pathologist. £250.
Newcastle-upon-Tyne, Hospital for Sick Children.—H.P., Sen. and Jun. H.S.'s. Each at rate of £100.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Sen. Surg. O. £200.
Oxford, The Warneford.—Jun. M.O. £300.
Princess Beatrice Hospital, Richmond-road, Earl's-court, S.W.—Res. M.O. At rate of £110.
Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas. O. Each at rate of £100. Also Asst. Surgeon.
Radium Institute, Riding House-street, W.—H.S. At rate of £150.
Royal Chest Hospital, City-road, E.C.—Physician to Out-patients.
Royal Free Hospital, Gray's Inn-road, W.C.—Two Asst. M.O.'s. Each £350. Also Res. Cas. O. £150.
Royal London Ophthalmic Hospital, City-road, E.C.—Pathologist and Curator. £200. Also Sen. Res. Officer. £150.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Surg. Reg.
St. Albans, Hill End Hospital.—Second Asst. M.O. £500.
St. John's Hospital, Lewisham, S.E.—Res. M.O. £200.
St. Leonards-on-Sea, Buchanan Hospital.—Sen. and Jun. H.S.'s. At rate of £175 and £125 respectively.
St. Mary's Hospital, W.—Cas. H.S. At rate of £100.
South London Hospital for Women, Clapham Common, S.W.—H.P. and H.S. Each at rate of £100.
Swindon, Great Western Railway Medical Fund Society Hospital. H.S. At rate of £200.
Warrington, County Mental Hospital, Winwick.—Asst. M.O. £500.
Watford and District Peace Memorial Hospital.—Res. Surg. O. At rate of £150.
Weir Hospital, Grove-road, Balham, S.W.—Jun. Res. M.O. £150.
West Bromwich and District General Hospital.—Cas. H.S. At rate of £200.
West End Hospital for Nervous Diseases, Gloucester-gate, Regent's Park, N.W.—Jun. H.P. At rate of £100.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Hon. Asst. Surgeon. Also Jun. Res. H.S. At rate of £100.
Westminster Hospital Annexe, 66, Fitzjohn's-avenue, Hampstead, N.W.—Res. M.O. £200.
Wolverhampton, New Cross Hospital.—Asst. Res. M.O. £200.
Wolverhampton Royal Hospital.—H.P. At rate of £125.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at St. Helens (Lancaster), Pwllheli (Caernarvon), Portobello (Mid Lothian), and Duffield (Derby).

Births, Marriages, and Deaths

BIRTHS

GOUGH.—On Sept. 6th, at Watford, the wife of A. Staveley Gough, F.R.C.S., of a daughter.

JAUCH.—On Sept. 7th, at Grantham, the wife of F. J. Jauch, F.R.C.S., of a daughter.

TAYLOR.—On Sept. 9th, at Foxley-lane, Purley, the wife of Dr. C. E. Taylor, of a son.

WAKELEY.—On Sept. 8th, at Welwyn Garden City, Herts, the wife of Dr. Leslie S. P. Wakeley, of a son.

MARRIAGES

MACNAB—STEPHENSON.—On Sept. 5th, in London, G. H. Macnab, M.B., Ch.B., of Colinton, Mid Lothian, to Juliette Audrey Stephenson, eldest daughter of Mr. and Mrs. Rowland Macdonald Stephenson, Hutton-place, Hutton, Essex.

ROBERTS—BLOOD.—On Sept. 7th, at Woodchurch Parish Church, Owen W. Roberts, M.D., M.S., F.R.C.S., to Winifred Eileen, daughter of Col. and Mrs. F. W. Blood, Birkenhead.

DEATHS

BRODIE.—On Sept. 9th, at Fernhill, Wootton Bridge, I.W., Major Charles Gordon Brodie, M.C., F.R.C.S., aged 73.

PLAYFAIR.—On Sept. 4th, suddenly, at Colinton, John Playfair, M.D., F.R.C.P.E., and Hon. F.R.C.S.E., of Melville crescent, Edinburgh.

ROOD.—On Sept. 10th, 1933, suddenly, at 109, Clarence Gate-gardens, N.W.1, Felix Stephen Rood, of 39, Harley-street.

ROSS.—On Sept. 3rd, in London, Colonel N. H. Ross, late R.A.M.C.

SMITH.—On Sept. 4th, at Worthing, Alfred Egerton Manners Smith, M.R.C.S., aged 73.

WAY.—On Sept. 4th, at a nursing-home, Southsea, J. H. Frederick Way, M.R.C.S., aged 65.

WRIGHT.—On Sept. 6th, suddenly, at West Cliff, Eastbourne, George Cornelius William Wright, M.D., M.R.C.S., L.R.C.P.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

THE PHILOSOPHY OF TREATMENT

By E. H. R. Altounyan, *M.C.*, M.D.
ASSISTANT SURGEON TO THE ALTOUNYAN HOSPITAL, ALEPPO

My title has been chosen because it touches on what I believe to be at the moment the cardinal weakness of our profession. A horrid metamorphosis seems to occur when the medical student enters upon practice. For five long years or more he has been marching surefooted with gallant comrades along the macadam road of anatomy, physiology, and pathology, following the course of artery and nerve, learning the chemistry of digestion, studying the changes in tissue under stress, with fact and theory, known and unknown, clearly defined. Then suddenly the road ends and those surefooted ranks are transformed into flocks of frightened fowl scattering over the marsh of general practice, clucking out nostrums and squawking in competitive panic on a thousand different notes. Can this shocking spectacle be entirely the result of following that famous precept: "treat the patient and not the disease"? Can this really excuse the multitudinous recipes for the same ailment? I think not. For whenever disease has been mastered it is found that—despite that avuncular maxim—uniformity of treatment rules successfully a thousand patients at a time. Swayed by fashion, stampeded by competition, we shillyshally between the bread poultice of our forefathers and the vaccine of an age to come, so that the bystanders are driven to exclaim: "What in the name of Hippocrates are they up to?" One thing is certain. We do not know ourselves.

For my own part I state with the utmost assurance—defiance if you will—that we stand before the public to-day as purveyors of facts about the body.

Let us consider for a moment the patient's point of view. Whether he be suffering from over-smoking, a stone in the kidney, or unrequited love, he comes to us, as to professed experts in bodily ailments, to be cured or—if that is not possible—to know the true condition of his economy in so far as we know it. This is my thesis—though, as I write, I see again the picture of an aged oriental crouched on his bed who raises a lean forefinger and exclaims: "Oh Doctor, if there is anything the matter, for the sake of Allah, tell it me not." Heaven be praised for the enchanting diversity of its creatures.

Use of Particular Remedies

As a rule then, the patient wants to be cured—and let us assume first that we can cure him. He has, for instance, a fractured femur. Surely here there can be no problem save the mechanical one of alignment and fixation. And yet, what answer do we give? One of us produces splints, bandages, and rolls of the most expensive cotton-wool; another, plaster-of-Paris; another, liking blood and complications, sets his whole staff to work at boiling steel plates; while his rival mutters something about grafts and beef-bone pegs. And yet fractures have occurred since the beginning of bone life, and we live in an age whose fierce attack on mechanical problems is well-nigh incandescent. And yet—and to make matters worse—this particular problem has actually been solved once and for all by skeletal traction some twenty years ago.

This then is my first and simplest example—the case where treatment is at fault not because we can't know or don't know, but simply because we cling in a hazy way to the magic of diversity.

Now let us take another instance of the treatment of a known and curable disease—peptic ulcer. Here we have tragi-comedy bordering on farce; for it seems at present as if the unfortunate patient must himself decide—and his very fate hangs on it—whether he shall apply to Dr. A, who, backed by the authority of the heaviest income-tax payers of the profession, will remove two-thirds of his stomach in order to save him from certain death, or to Dr. B, who prescribes wholesale the ghoulish diet of bismuth and olive oil. Yet here is a known and established disease. We can see the ulcer, we can almost hear it drip, and we have had, in all conscience, enough statistics of the opposing schools of treatment to enable us to form a judgment. Nevertheless, the patient of to-day will find it difficult to discover an adviser who will not express himself as partial either to medicine or surgery, as though he were discussing the respective merits of beef and mutton. The actual controversy is irrelevant; I would merely insist that we seem to have failed in our duty to the public when we allow ourselves to become partisans. One cannot help wondering how much of the bias is due to sheer inability to assess scientific evidence and how much to the fact that money considerations take the field. On the one hand some of our most expensive and lucrative medical nursing-homes are maintained by ulcer patients; on the other hand the gastric surgeon claims for an intricate and technically very interesting operation a not uninteresting fee.

Use of General Methods of Treatment

So far we have been on firm ground. Who can deny that the profession as a whole lags pitiably behind in its application of established discoveries; who can doubt that the bias of specialism turns often to the detriment of the sufferer? But now we must launch out into the blue. By far the largest part of our work has to do with diseases in which time, rest, and warmth are the sole factors in the treatment.

Rest and warmth have already been prescribed by the home circle, and we are called in to give the assurance of the expert that time will do the rest.

What happens? At first all goes well. The patient is questioned and examined with meticulous care. Advice is given as to food and drink, the temperature of the room, and the probable duration of the disease. So far all is above board. And then with pantomimic suddenness magic enters. In the room voices are hushed, the doctor takes out a pad of peculiar paper and the family follows anxiously the scratching of the professional pen. Mumbo Jumbo sits enthroned: the prescription is being written. Rest, warmth, diet; unalarming prognosis, simple home remedies are not enough. Like a fool's cap crowning the scene comes the mysterious formula, to be got as often as not only at a certain pharmacy, conveyed in writing cunningly illegible to all but the fellow conspirator. Thus do we, forsaking honesty, grasp at opportunity backed by tradition and a hundred arguments; thus do we seek to maintain our hold, using dubious means and reaping the advantage of a false association.

It is because I believe in drugs that I condemn this practice as intolerable; it is because I am proud of our art that I consider its misuse a prostitution. I shall be told that the public expects it. The public has expected many things which we have not given it. There was time when men, alarmed by fever, estimated the skill of a doctor by his ability to prescribe a febrifuge (still earlier was it not a purge?). Our all too willing associates, the manufacturers of synthetic preparations, promptly produced a truly appalling list of these dangerous drugs. Then suddenly—one fine morning as it were—some bold person suggested that we might tell our patients that fever was beneficial, a sign even that the body was doing its best. The public was startled, wobbled for a year or two, then bowed with a sigh to the new decree. It is just because our position is so overwhelmingly strong that I consider humbug—whatever the excuse—to be intolerable. It is a

significant fact that when a doctor treats his family—still more when he treats himself—prescriptions costing solid cash do not somehow figure so prominently; and I suspect that the laity is becoming aware of it.

To sum up this aspect of my subject—I maintain that in by far the greater number of our cases we are asked in for diagnosis, prognosis, and simple advice, and that our patients are quite prepared to consider that they have had their money's worth without being asked to contribute to the pharmacist next door.

Chronic Disease

Some of us more especially have to treat those suffering from some chronic non-fatal disability for which no cure is known. Weeks, even months, may have to pass in examination and diagnostic treatment in which the prescribing of drugs of known and well-tried action certainly plays an important and essential rôle, but finally the day must come when we are faced with a patient who has appealed to us in vain.

Sterility in women is perhaps one of the most distressing instances of this kind. I should have thought that our course of action was obvious, yet I have recently seen it seriously advocated in the medical press that the husband should on no account be examined lest, finding that he is at fault and thereby annihilating hope, the result might be disastrous and lead even to suicide. Such a view seems to me to represent the acme of wrongheadedness. Such a doctor, it appears, would condemn without hesitation a woman to undergo a series of expensive and unpleasant procedures, including even a major operation, rather than oblige her to face the facts and meet the situation squarely. If suicide is really a risk in such a case it is surely one that is not worth considering. If the inevitable is too much for such a person, then the sooner he or she disappears from the scene the better for all concerned.

When at last we are obliged to pronounce on the chronic incurable we must not only destroy all hope of cure at our own hands, but also—without disloyalty to our colleagues—discourage the patient from seeking it elsewhere. No one who has lost an eye pesters the oculist for a new one. If our particular patient is not made to feel that continuance of any form of treatment is as absurd as that, we have failed to render the only service that was required of us.

The Neuroses

The question is not so simple when we come to discuss the neurotic. I mean by that term those who, finding that life is too much for them, have been drawn to take refuge in the contemplation of their bodily functions. Such come to us primarily for the sympathy one expects from a sharer of the same hobby. Fortunately (for both parties) there is no diagnosis more hazardous or difficult to establish than that of the neuroses. Fortunately, I say, for much time must be consumed while the inevitable and expensive examinations take place so necessary to eliminate a lesion of the brain, the hidden cancer, or an obscure focus of infection. Even so, sooner or later the day arrives when the answer must be given. Many of these unfortunates show on their abdomens the scars of incisions, doubtless admirably devised. Many have travelled round the world seeking sun, seeking baths, seeking more and yet more physicians; all have their pocket-books stuffed with well-creased prescriptions. Well, and what shall we do? Do I hear someone whisper: psycho-analysis? Why not? It is or was a magic word, and the treatment is at least carried out on a scientific basis. Our job as humdrum practitioners is over. Wrapped in the majesty of all the findings of the laboratory and clinic we can tell such a one that the trouble lies in his own fat head, and that unless he wishes to find himself in an asylum he had better set to work and—sail a boat!

Of course I know there is the old lady—bless her!—with her lapdog and comfortable balance in the bank, and that clever doctor who does do her such a lot of good with his bright breezy bi-weekly visits and funny stories. Many a stout family has been reared, many a good car kept on just such a practice. But I suggest that these gentlemen trading on personality, exploiting jolly good fellowship, blowing like a great healing wind through the sick room, these, I say, should be given in addition to their M.D. a special diploma, just to distinguish them from—us.

The Hard Truth

But how should one treat those afflicted with necessarily fatal disease? Palliation of pain, of course, but what else? There seems to be an extraordinary idea abroad that human beings are immortal until suddenly smitten down by the ruthless doctor. Had we the knowledge to predict the exact moment any one of our patients must die, I admit that such knowledge should best be locked up in our hearts. But as none of us can foretell even roughly the moment of death we are simply faced with this proposition: a person is found to be afflicted with a disease which he will never get rid of, a disease moreover which will probably curtail his life—always supposing that this is not done for him by a passing car. Can there be any doubt that the sooner we lay these facts before him the better we shall be fulfilling our duty? Then and only then, freed from gnawing anxiety and ineffectual striving, can he look to his business and set his house in order, making the most of the precious moments that remain. And yet I have heard friends successfully persuade the doctor to hide the truth and compel the condemned to fritter away his time, and the money which he might leave to his dependents, in consulting one physician after another, seeking the unattainable. Does gloom necessarily cloud over such a man when he knows the truth? The cancer wing of the Middlesex Hospital is a sufficient answer to such a question.

I know of one circumstance and only one when a doctor is justified in hiding the truth from his patient—and that is when he does not know it. I am thinking more particularly of those acute illnesses when the patient is in great distress and the outcome is utterly uncertain. Even here it is an imbecile policy that makes the medical attendant assume the mask of inane bonhomie and hearty assurance while behind the door his face droops into the classic lines of self-excusing gloom—as though the patient, say in acute pneumonia, fighting for breath, had not a faint inkling that his life was in danger. What I should want my medicine man to tell me at such a time is that I have a jolly poor chance of pulling through, but I may as well go on breathing while I can. That at least is a statement of fact, and—believe me—facts alone count when in extremis.

And then we come to the death-bed scene when the house is hushed and the relatives flutter about distracted with grief, and the doctor is called in to confirm the verdict. Is this the time for magic and mummery, for the hurried writing of yet another prescription, for the injection of this or that? The man is dying: facing reality with every fibre of his body. He can excuse the relatives frightened by death, sorrowing at impending loss, but surely he can look to his doctor, familiar with death and not bound by emotional ties, to stand by and assure him that what is happening is a normal process, normal since the beginning of time.

Remedies which are not Established

I must at this point register an emphatic protest against the great combines of therapeutic products which at the moment form the greatest bar to sanity in treatment. These firms are deluging the world with new products, many of which have as their sole claim to consideration the fact that they do no obvious and immediate harm. Drug upon drug after trial on three guinea-pigs and the lab. boy is confidently recommended for our use; and we, poor fools that we are, afraid of falling behind the times, forgetting the solid training of our long early years, prescribe them recklessly for a week or two

until the next traveller comes by bringing in new gay-coloured wares. Buried in the rubbish there lurks no doubt many a valuable compound; but who can stay to assay, who can take time to prove its worth?

And yet by a determined effort doctors could call the tune of the manufacturers.

Honesty and its Application

But enough or too much of destructive criticism. Let me restate my case. We stand as professed purveyors of facts concerning the functions of the human body. Where no particular treatment is required none should be given. Where it is indicated we should make certain of every agent that we use, so that whether we fail or succeed at least we learn. Specialism means bias often to the detriment of the patient, but by far the greatest obstacle to honest dealing is the failure to realise what our patients really want from us. Of practical measures I have suggested a concerted stand against drug combines. Still more important to my mind is the need for a complete dissociation of any particular treatment from a corresponding pecuniary reward. I am convinced that some form of universal State medicine would, whatever its disadvantages, cut right at the heart of the problems I have been discussing. I think that all treatment by suggestion must be abandoned. Legitimate in psychiatry, elsewhere it infallibly retards the advancement of our science. Even when successful, the success is bought at the loss of our self-esteem; when it fails it drives our indignant patients straight into the power of the empirics. We must abandon that triple rôle of wizard, father confessor, and friend that has in some measure been thrust upon us. We must fling down the barriers of personal reserve.

In conclusion let us consider whether even under existing conditions we cannot do something to raise medicine to its rightful place among the sciences. We have everything in our favour, but we are apt to mistrust the fundamental wisdom and common sense of common man. The fear of suffering and disability—the strongest single force in life—impels men to seek our aid. We have chosen the practice of medicine to answer that appeal. Those who come to us asking for the waving of wands must be sent empty away. We have no right to misapply the consecrated ritual of medicine and surgery to meet that need. Humanity stumbling through the valley of the shadow needs trusty guides. It does not expect omnipotence, omniscience, or infallibility, but craves deeply for honesty.

CATALOGUE OF INSTRUCTIONAL FILMS

THE catalogue of instructional films which has recently been issued by the Central Information Bureau for Educational Films (103, Kingsway, London, W.C.2) does not claim to present an exhaustive list, but is believed to be the first convenient conspectus of the films available for use by educational and social organisations in Great Britain. It is a survey rather than an assessment of the existing material, no discrimination in respect of quality having been made. The films are grouped under ten main headings, including agriculture, art, history, science, and so forth. The science section is further divided into seven subheadings: anthropology; astronomy; hygiene, nursing, and child welfare; nature study; physics, chemistry, and geology; physiology; and psychology. The title of each film, its length in feet or minutes, whether it is on flammable or inflammable stock, is silent or talking, are recorded with the organisation from which it may be obtained. An alphabetical list of the Government departments, societies, and business firms mentioned in the catalogue is given at the end. The book is issued free to subscribers to the bureau and is available to non-subscribers for 3*s.* 6*d.*

NEW PREPARATIONS

ANGIOLYSIN.—For this preparation, which has been sent to us by the Chemische Fabriken (Dr. Joachim Wiernik, A.-G.) Berlin-Waidmannslust, the quality of coronary dilatation is claimed. The manufacturers state that clinical trials have proved its use in primary attacks of angina and other cardiac irregularities, and quote medical authority in support. It is supplied in tubes each of which contains 25 tablets of the preparation, which consists of adenosinphosphoric acid and pyrrhodid, described as a new dimethyl-aminophenazonrhoden combination. The drug is thus designed to act as a dilator and antispasmodic. The agents for distribution of this preparation are Messrs. Coates and Cooper, Clerkenwell-road, London, E.C.

ERGOCHOLIN.—The same agents distribute from the Chemische Fabriken this preparation, which is a combination of the cholin derivative Pacyl and pure ergot, the alterations in blood pressure sometimes set up by the latter being compensated for by Pacyl. The preparation has also received medical support in Germany.

ALLERGILAC.—We have received from Messrs. Cow and Gate, Ltd., Guildford, a sample tin of this new milk food which is designed for use in cases of allergy in infancy. Sensitisation to protein manifests itself in infancy in a variety of ways, and in some cases infants develop under it serious attacks of dyspnœa and asthma, urticaria, or vomiting. Entire omission of milk in the diet is well-nigh impossible, and an attempt is made in this preparation to remove the offending protein. The composition of allergilac is:

	Powder.	Reconstituted milk (1 in 8).
Moisture	3·0	88·0
Fat	15·5	1·9
Casein	24·0	3·0
Lactalbumin	1·0	0·1
Ash	6·7	0·8
Lactose	49·8	6·2
	100·0	100·0
		Acidity 27°
		pH value 6·0

OPERATION FOR CARCINOMA OF THE CARDIA

LOCAL resection of the œsophago-gastric junction for carcinomatous obstruction is a palliative measure which is rarely held to be justifiable. The course of gastric cancers is usually rapid, and when complete removal of the growth is out of the question it is always doubtful whether an operation of this magnitude is worth while. At the same time R. Ingebrigtsen,[1] who reports a case which was treated successfully in this way, points out that subsequent restoration of the continuity of the alimentary canal is here comparatively easy, and that the operation offers a means of overcoming the difficulties of feeding and of avoiding gastrostomy or intubation with their attendant disadvantages.

His patient was a woman of 49, with a year's history of progressive dysphagia and emaciation. The diagnosis of carcinoma of the cardia was established by radiographic and œsophagoscopic examinations. As a preliminary, pneumothorax was induced, with phrenic evulsion in addition in case it should prove necessary to open the chest. Laparotomy under ether narcosis revealed an extensive growth, infiltrating the wall of the œsophagus for about a centimetre, spreading into the gastro-colic ligament and great omentum, and adherent to the pancreas, aorta, vena cava, and splenic artery. Radical operation being judged impracticable, local removal was decided upon. The growth was dissected away from the structures to

[1] Acta Chirurg. Scand., 1933, lxxiii., 43.

which it was adherent and was removed by cutting through the stomach below it and the œsophagus above. The gap in the stomach wall was closed and œsophagogastrostomy was performed. A temporary jejunostomy was then made for feeding purposes. Despite the various adverse conditions (cancerous infiltration of surrounding parts, the septic state of the growth), healing took place satisfactorily except that a fistula remained; this admitted lipiodol but was too narrow to allow of leakage of food after the first day of mouth-feeding.

Unfortunately the subsequent history of this patient is not given. The value of case reports such as this would be greatly enhanced if they were not published until the results of the treatment could be stated.

MEDICAL EDUCATION IN BURMA

THE Burma Government Medical School at Rangoon reports on an active year's work. Forty new students were admitted in June of last year. Out of 42 students who took the second part of the final examination, 23 passed. The total number qualifying as sub-assistant surgeons was 38 men and 4 women, a pass percentage of 80. The figure is very high compared with the 22 men and 4 women of the preceding year, and the 10 men and 2 women of the year before. It is probably a peak, because the balance sheet shows a drastic reduction of expenditure—a decrease of nearly Rs.17,000—which can hardly fail to be reflected in the future output. From the analysis of religions and races about half the students appear to be natives of Burma and the remainder Indians, with a sprinkling of Europeans and Anglo-Indians; of the 42 who passed during the year under review, 33 were Indians and only 7 Burmese, 2 of whom were women. The prize-winners and gold medallists, with only one or two exceptions, appear from their names to be Indians. The improvement in the teaching of anatomy and physiology has, the superintendent says, been maintained, and the usual course of training in practical midwifery was given at the Dufferin Hospital, Rangoon. The discipline, conduct, and health are reported as satisfactory.

BIOLOGY IN SCHOOLS

A WELCOME sign of the changed attitude towards the inclusion of the biological sciences in the ordinary school curriculum is seen in the number of books now appearing which deal with these subjects in an elementary way. Miss M. E. Phillips and Miss L. Cox, who have already published one text-book on elementary biology for students of matriculation standard, have now prepared an admirable introduction to the subject [1] in response to many requests for something simply written. The approach to biology, considered by them to be the most satisfactory, is through "Nature Study"; hence the examples chosen for study are plants and animals familiar to town and country children alike. They are also for the most part such as can be kept or examined in an ordinary classroom. The book should prove of value in giving an idea of some of the life processes to quite young children. It is interestingly written, in very simple language, with a minimum of technical terms, and has an abundance of illustrations. The adult reader may well be unfamiliar with the habits and ways of some of the more common living things considered, and may be stimulated to carry out the suggested observations.

Another book recently issued [2] covers the ground necessary for students taking biology in School Certificate examinations. It is naturally more limited in range, since a sufficiently detailed account of the various "types" of animals and plants prescribed in syllabuses must be supplied. The descriptions are as brief as is compatible with competent treatment. In the later chapters Dr. Wyeth discusses general biological principles, and this part of the book is enriched with clear accounts of many instructive experiments which can be carried out without much apparatus. The chapters dealing with nutrition and respiration in plants and animals and with irritability are good, and teachers of biological subjects in general will find the experiments suggestive. The issue of such books as these will encourage those who long have been pleading for the introduction of the biological sciences into the routine school curriculum.

[1] A First Book of Biology. By Mary E. Phillips, B.Sc., Biology Mistress, Godolphin and Latymer School; and Lucy E. Cox, B.Sc., F.L.S., Lecturer in Biology, Graystoke Place Training College. London: University of London Press. 1933. Pp. 270. 2s. 6d.

[2] Elementary General Biology. Part I. By F. J. Wyeth, M.A., Sc.D. Cantab., D.Sc. Lond., Headmaster of Newport School, Essex. London: G. Bell and Sons, Ltd. 1933. Pp. 202. 3s. 6d.

TECHNIQUE IN ACTINOTHERAPY

Sir Henry Gauvain says in a foreword to a book on actinotherapy, issued by the Sollux Publishing Co.,[1] that it supplies in convenient form an aid to special technique in treatment which is practical, illuminating, and helpful. A part only of the whole field of actinotherapy is reviewed, since the subject matter is restricted to irradiation with quartz lamps, luminous heat being introduced as an adjuvant to treatment; but if this limitation is borne in mind the information given will be found complete and accurate. We are told by the editors—unnamed—that nearly 1000 books and papers have been consulted in building the outline of the technique presented. References to these works are given under each section, and thanks are due to the publishers for making this vast amount of original work accessible to the general reader. The criteria adopted in the choice of publications consulted are (1) personal experience of the treatment described and (2) absence of later publications superseding the work published. There are few statements in this small manual to which exception can be taken. One may question, perhaps, if the optimism of the section on treatment of high blood pressure reflects the generally accepted opinion. A temporary fall in blood pressure has often been recorded, but not all workers agree that a more permanent favourable result may be expected. The advisability of irradiation during the acute stage of anterior poliomyelitis is open to question, especially if combined, as here suggested, with static electricity to lower spine and mechanical vibration. The section on the treatment of tuberculosis is perhaps the most helpful. In connexion with the paragraphs dealing with the treatment of tuberculous adenitis, it should be pointed out that not all actinotherapeutists are in favour of intensive local treatment as an adjuvant to general irradiations when glands approach caseation. The index of references given to authoritative literature is one of the most useful features of the manual.

SURGICAL TUBERCULOSIS IN THE SENEGALESE

NATIVE troops garrisoned in the south-west of France present some special problems to the medical officers in charge of them. For example, tuberculosis behaves so differently from the same disease in Europeans that, but for Koch's discovery of the tubercle bacillus, the clinician would be tempted to recognise two quite different diseases. In the *Archives de Médecine et de Pharmacie Militaires* for May, Lieut.-Colonel M. Courboules discusses the difficulties to which these differences give rise. His material consists of four score natives of Senegal and Madagascar who developed some form or other of surgical tuberculosis while serving in the army in France. Characteristic features of the tuberculosis they developed were the speed with which it progressed, the difficulty with which it was diagnosed

[1] Actinotherapy Technique, with foreword by Sir Henry Gauvain, M.D., M.Chir., F.R.C.S. Slough: The Sollux Publishing Co. 1933. Pp. 184. 6s.

in an early stage, and the impotence of standard methods of treatment. In uncomplicated Pott's disease, for example, the European usually takes two, three, or four years in which to stabilise his lesions. Such stabilisation, with disappearance of pain and bacillæmia, and formation of new bone, is almost unknown in the Senegalese. In his case the local disease tends to become general and speedily to end in death. Among about 30 cases of Pott's disease, more than half were dead within a year of the first consultation, and within ten months of admission to hospital. Only in 5 cases was it possible to check the progress of the disease to such an extent that the patients could be repatriated; even in these cases Courboules ends his discussion of the ultimate prognosis with three exclamation marks. Among 7 cases of hip disease, there were 4 in which death occurred in 7 to 15 months. Matters would not be so bad but for the difficulties attending early diagnosis. This is hampered not only by peculiarities in the early manifestations of the disease in the native, but also by his inability to express himself intelligibly. Medical practice among the Senegalese is in this respect comparable with veterinary surgery; and Courboules quotes from a fellow army surgeon who found among 167 men admitted to hospital for Pott's disease as many as 21 in which this diagnosis could not be upheld. Among 82 alleged cases of hip disease there were only 59 in which the same surgeon could confirm the original diagnosis. The European's capacity for self-expression is usually supplemented by unequivocal X ray signs of Pott's disease. The inarticulate Senegalese, on the other hand, is badly served by X rays, which failed Courboules in every third case. His sombre picture of surgical tuberculosis in the dark races ends with the advice that the patient be repatriated as quickly as possible. A probability diagnosis should suffice, for when the diagnosis is clinched the patient is often too ill to be moved.

VITAMINS

THE subject of the vitamins has recently been well covered in English by publications of varying degrees of cost and erudition. A manual[1] by an American worker, Prof. Barnett Sure, gives an adequate account in a small space of the most important aspects of accessory food substances. It is marred by a tiresome tendency to bring in long words and explain them, when no long word need have been used, and, for the English reader, by forms of speech unfamiliar to him. There are some notable omissions, such as the failure to mention the name of Szent-Györgyi in connexion with hexuronic acid and vitamin C, although other names are mentioned. Intelligent laymen as well as medical students will, however, find here the essentials of what is known about vitamins.

GIANTS AND DWARFS

A SMALL book on giants and dwarfs[2] falls into that rare category of essays which make the reader wish that they were much longer. The introductory historical section, giving accounts of abnormally large and unusually small people, is absorbing, and one feels that Mr. Futcher must know many more stories of giants and dwarfs which he could tell us if he were encouraged. The description of John Hunter's acquisition of the skeleton of the Irish giant is particularly well told. The notes on the purely physiological aspect of the subject are rather disappointing, partly because they are too compressed and partly because some of Mr. Futcher's theories of endocrine activity are not quite up to date. It is fair to remember that a determination to be really up to date in descriptions of the aberrations of function of the ductless glands would imply the issue of new editions of any publication almost monthly. Mr. Futcher's true fairy tales cannot fail to interest his readers.

[1] The Vitamins in Health and Disease. By Barnett Sure, Ph.D., Professor of Agricultural Chemistry, University of Arkansas, Fayetteville, Arkansas. London: Baillière, Tindall and Cox. 1933. Pp. 206. 11s. 6d.

[2] Giants and Dwarfs, a Study of the Anterior Lobe of the Hypophysis. By Palmer Howard Futcher. London: Humphrey Milford, Oxford University Press. 1933. Pp. 80. 7s.

NUMBER OF PRACTISING DOCTORS IN GERMANY.—A recent issue of the *Medizinische Klinik* gives the latest figures for the number of practitioners in Germany. On Dec. 31st, 1931, there were about 51,000 German doctors living, of whom 48,000 were in practice, a number showing only a trifling increase on those at the end of the two previous years. The number of doctors to 10,000 inhabitants remains at 7·4, and the number to 100 square miles at 10·2. As in previous years there was in Germany roughly one doctor to every 1350 inhabitants. The number of women doctors was somewhat larger than heretofore—550 more than in 1928, 1000 more than in 1927, and nearly 2700 more than in 1909.

FOREIGN BODIES IN THE CORNEA.—An electromagnetic extractor has been designed by Messrs. Frank Moss and Co. (23, Warwick-row, Coventry) for the removal of metallic splinters embedded in the cornea. The apparatus is handy and portable, and on attachment to any dry battery or accumulator of 2 to 6 volt capacity it develops a drawing power of at least four ounces, which should be ample for the removal of a foreign body from the cornea. It seems likely that in this way metallic splinters which are magnetisable can be removed more quickly and with less trauma than by an ordinary spud. The price of the instrument in silk-lined case is 35*s*. post free.

COURSES IN STAGECRAFT.—Those who are responsible for entertainments in institutions and hospitals are reminded that the winter course on dramatic production, at the Everyman Theatre, Hampstead, will start this year on Sunday, Oct. 8th, at 3 P.M., and will be held on alternate Sunday afternoons till Dec. 3rd. The course will include classes in make up, costume design, scene and property making—all the practical knowledge, in fact, which enables a producer to give help to his players. There will also, this term, be a specialised course in play writing and play technique, and though comparatively few of our readers may be writing plays for themselves, this course should also be of use in the nice appraisement of possible plays for production. The course is organised by the Little Theatre, Citizen House, Bath.

REGISTER OF THE C.S.M.M.G.—We have received from the Chartered Society of Massage and Medical Gymnastics (Tavistock House North, Tavistock-square, London, W.C.1) a register of masseuses and masseurs, covering the period July, 1920, to April, 1933. As usual it gives, in addition to name and address, the additional qualifications registered in medical gymnastics, electricity, light, and electrotherapy, distinguishing between teachers and those in private practice. Following the alphabetical register is an index of names arranged under postal districts. In this edition of the register there are a number of gaps in the column for the address. In order to keep the register up to date each member of the society was asked to inform the secretary of her/his present address, and it was stated that, unless the information was received by a given date, the name only would appear in the new edition. The price of the register is 4*s*.—We have also received from the hon. secretary of the Scottish local board of the society (25, Queensborough-gardens, Glasgow, W.2) a list for 1933 of those members who are practising in Scotland. It has been issued with a view to providing medical practitioners in Scotland with a list more convenient for reference on account of its limitation to the Scottish area. No price is stated nor any indication given where the list can be obtained.